

modern machine shop

**SHOW OF
SHOWS**

See Page 100

**ABRASIVE
MACHINING**

See Page 106

**THREAD
ROLLING**

See Page 128

JUNE 1955



**The Best
Costs No More**

American

DRILL BUSHING CO.

5107 PACIFIC BOULEVARD
LOS ANGELES 58, CALIFORNIA

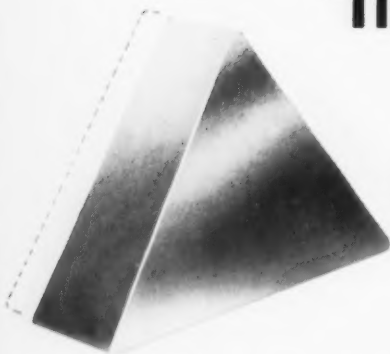
NOW!

for the first time...

new, lower cost **ADAMAS**

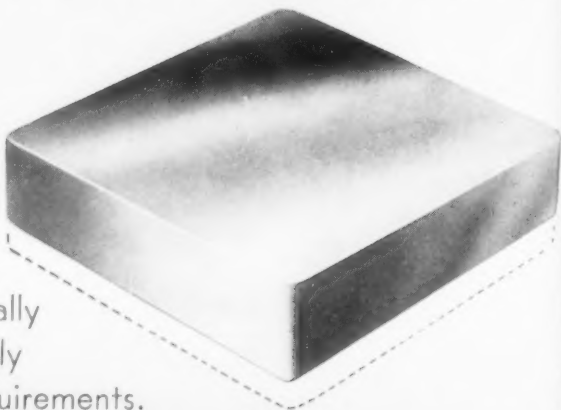
'Throw-Away' blanks

— each size
in two thicknesses



No matter what your choice
of popular 'Throw-Away'
blank tool holders...

you'll find an Adamas
'Throw-Away' blank specifically
engineered to fit perfectly
with your tooling requirements.



Adamas 'Throw-Away' blanks are available in utility grind
(top and bottom ground only) and in
precision grind (ground on all surfaces for precision indexing).

For more pieces between indexing — lower
production costs — order Adamas 'Throw-Away' blanks
in either standard or premium carbide grades.

Call your local Adamas representative or write
Department C77, ADAMAS CARBIDE CORPORATION
Kenilworth, New Jersey for price lists.

ADAMAS CARBIDE CORPORATION • KENILWORTH, NEW JERSEY

↓ Use this Reader Service Card for requesting more information on products described and advertised ↓

READER SERVICE CARD

(PLEASE PRINT PLAINLY)

June 1955 Issue

GOOD UNTIL AUGUST 1, 1955

Your Name _____

Your Title _____

Company Name _____

Company Address _____

City _____

Zone _____

State _____

**modern
machine
shop**

431 Main Street
Cincinnati 2, Ohio

Circle KEY numbers (NOT PAGE NUMBERS) for more information on items described or advertised in this issue.

EDITORIAL ITEMS

| | | | | | | | |
|----|----|----|----|-----|-----|-----|-----|
| 1 | 21 | 41 | 61 | 81 | 101 | 121 | 141 |
| 2 | 22 | 42 | 62 | 82 | 102 | 122 | 142 |
| 3 | 23 | 43 | 63 | 83 | 103 | 123 | 143 |
| 4 | 24 | 44 | 64 | 84 | 104 | 124 | 144 |
| 5 | 25 | 45 | 65 | 85 | 105 | 125 | 145 |
| 6 | 26 | 46 | 66 | 86 | 106 | 126 | 146 |
| 7 | 27 | 47 | 67 | 87 | 107 | 127 | 147 |
| 8 | 28 | 48 | 68 | 88 | 108 | 128 | 148 |
| 9 | 29 | 49 | 69 | 89 | 109 | 129 | 149 |
| 10 | 30 | 50 | 70 | 90 | 110 | 130 | 150 |
| 11 | 31 | 51 | 71 | 91 | 111 | 131 | 151 |
| 12 | 32 | 52 | 72 | 92 | 112 | 132 | 152 |
| 13 | 33 | 53 | 73 | 93 | 113 | 133 | 153 |
| 14 | 34 | 54 | 74 | 94 | 114 | 134 | 154 |
| 15 | 35 | 55 | 75 | 95 | 115 | 135 | 155 |
| 16 | 36 | 56 | 76 | 96 | 116 | 136 | 156 |
| 17 | 37 | 57 | 77 | 97 | 117 | 137 | 157 |
| 18 | 38 | 58 | 78 | 98 | 118 | 138 | 158 |
| 19 | 39 | 59 | 79 | 99 | 119 | 139 | 159 |
| 20 | 40 | 60 | 80 | 100 | 120 | 140 | 160 |

ADVERTISEMENTS

| First Cover | Second Cover | Third Cover | Fourth Cover |
|-------------|--------------|-------------|--------------|
| 201 | 220 | 239 | 258 |
| 277 | 296 | 366 | 385 |
| 404 | 423 | 442 | 461 |
| 480 | 499 | 518 | 537 |
| 556 | 575 | 594 | 613 |
| 202 | 221 | 240 | 259 |
| 278 | 297 | 367 | 386 |
| 405 | 424 | 443 | 462 |
| 481 | 500 | 519 | 538 |
| 557 | 576 | 595 | 614 |
| 203 | 222 | 241 | 260 |
| 279 | 298 | 368 | 387 |
| 406 | 425 | 444 | 463 |
| 482 | 501 | 520 | 539 |
| 558 | 577 | 596 | 615 |
| 204 | 223 | 242 | 261 |
| 280 | 369 | 388 | 407 |
| 426 | 445 | 464 | 483 |
| 502 | 521 | 540 | 559 |
| 578 | 597 | 616 | |
| 205 | 224 | 243 | 262 |
| 281 | 351 | 370 | 389 |
| 408 | 427 | 446 | 465 |
| 484 | 503 | 522 | 541 |
| 560 | 579 | 598 | 617 |
| 206 | 225 | 244 | 263 |
| 282 | 352 | 371 | 390 |
| 409 | 428 | 447 | 466 |
| 485 | 504 | 523 | 542 |
| 561 | 580 | 599 | 618 |
| 207 | 226 | 245 | 264 |
| 283 | 353 | 372 | 391 |
| 410 | 429 | 448 | 467 |
| 486 | 505 | 524 | 543 |
| 562 | 581 | 600 | 619 |
| 208 | 227 | 246 | 265 |
| 284 | 354 | 373 | 392 |
| 411 | 430 | 449 | 468 |
| 487 | 506 | 525 | 544 |
| 563 | 582 | 601 | 620 |
| 209 | 228 | 247 | 266 |
| 285 | 355 | 374 | 393 |
| 412 | 431 | 450 | 469 |
| 488 | 507 | 526 | 545 |
| 564 | 583 | 602 | 621 |
| 210 | 229 | 248 | 267 |
| 286 | 356 | 375 | 394 |
| 413 | 432 | 451 | 470 |
| 489 | 508 | 527 | 546 |
| 565 | 584 | 603 | 622 |
| 211 | 230 | 249 | 268 |
| 287 | 357 | 376 | 395 |
| 414 | 433 | 452 | 471 |
| 490 | 509 | 528 | 547 |
| 566 | 585 | 604 | 623 |
| 212 | 231 | 250 | 269 |
| 288 | 358 | 377 | 396 |
| 415 | 434 | 453 | 472 |
| 491 | 510 | 529 | 548 |
| 567 | 586 | 605 | 624 |
| 213 | 232 | 251 | 270 |
| 289 | 359 | 378 | 397 |
| 416 | 435 | 454 | 473 |
| 492 | 511 | 530 | 549 |
| 568 | 587 | 606 | 625 |
| 214 | 233 | 252 | 271 |
| 290 | 360 | 379 | 398 |
| 417 | 436 | 455 | 474 |
| 493 | 512 | 531 | 550 |
| 569 | 588 | 607 | 626 |
| 215 | 234 | 253 | 272 |
| 291 | 361 | 380 | 399 |
| 418 | 437 | 456 | 475 |
| 494 | 513 | 532 | 551 |
| 570 | 589 | 608 | 627 |
| 216 | 235 | 254 | 273 |
| 292 | 362 | 381 | 400 |
| 419 | 438 | 457 | 476 |
| 495 | 514 | 533 | 552 |
| 571 | 590 | 609 | 628 |
| 217 | 236 | 255 | 274 |
| 293 | 363 | 382 | 401 |
| 420 | 439 | 458 | 477 |
| 496 | 515 | 534 | 553 |
| 572 | 591 | 610 | 629 |
| 218 | 237 | 256 | 275 |
| 294 | 364 | 383 | 402 |
| 421 | 440 | 459 | 478 |
| 497 | 516 | 535 | 554 |
| 573 | 592 | 611 | 630 |
| 219 | 238 | 257 | 276 |
| 295 | 365 | 384 | 403 |
| 422 | 441 | 460 | 479 |
| 498 | 517 | 536 | 555 |
| 574 | 593 | 612 | 631 |

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machine
shop**

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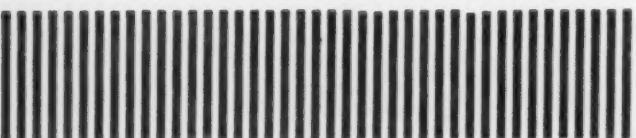
VILLAGE STATION

NEW YORK 14, NEW YORK

FIRST CLASS

PERMIT No. 7414

NEW YORK, N. Y.



JUNE

1955

Vol. 28

No. 1

CONTENTS

modern machine shop

M. L. FORNEY, *Publisher*

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FEATURES IN THIS ISSUE:

- 106** Coated Abrasive Machines in Close Tolerance Work • By A. W. Bell
- 110** New Die Storage Facilities Save Factory Space • By Gilbert C. Close
- 116** Loose Bids Mean Lost Profits • By Robert J. Flynn
- 122** Welding Paper Abstracts
- 128** New Machine Extends Thread Rolling Process
- 132** Unusual Dust Collector Installation Conserves Plant Space • By W. W. Peterson
- 134** Automatic Crankshaft Machining
- 136** Spline Honing Hardened Gears
- 144** Incentive System Applied to Grinding of Expensive Races
- 150** Resharpener Large Dies
- 152** Planing Boiler Plate
- 156** Practical Methods of Steel Identification • By Howard E. Boyer

184 IDEAS FROM READERS

- 48** Important Meeting Dates
- 53** Advertising Representatives

DEPARTMENTS:

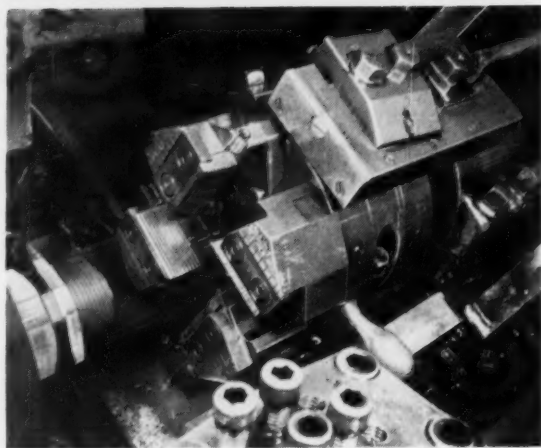
- 192** New Literature
- 198** News of the Industry
- 226** New Shop Equipment
- 336** "Where to Get It"
- 346** Editorial
- 348** Index to Advertisements

Member



Published monthly and copyrighted (1955) by Gardner Publications, Inc., 431 Main St., Cincinnati 2, O.
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STAINLESS STEEL

Tapered Threads

cut with **Better** Finish **Longer** Tool Life

1½" Tapered Pipe Threads are cut in 304 stainless steel reducing bushings at Camden Machine Company, New Haven, Conn. These threads are produced by a 1¼" LANDMATIC Taper Attachment Head on a 3¼" Gridley single-spindle automatic at 15 surface feet per minute.

The thread finish is greatly improved from previous methods and 1000 pieces are completed between chaser grinds—an increase of more than 10 times.

These improved results can be entirely attributed to the use of the Taper Attachment and the free cutting action of the Landis Tangential Chaser. Through the Taper Attachment, cutting action is limited to the throat section or chamfer of the chaser, allowing the thread to be cut quickly with little "cold-working." This action reduces cutting strains to a minimum and results in uniform tapered threads.

LANDIS Taper Attachment Heads are stationary self-opening heads for cutting tapered threads of all types. Six sizes of heads thread all diameters from ¼" to 6". Ask for Bulletin F-90.

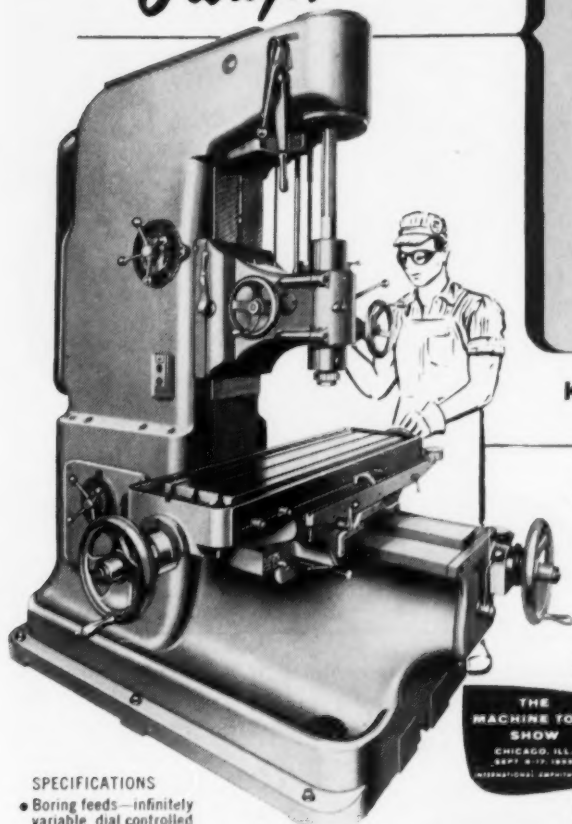
LANDIS Machine COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.

418

For more data circle 201 on Reader Service Card

How 1 Machine Can Save Time & Money 6 Ways!



SPECIFICATIONS

- Boring feeds—infinitely variable, dial controlled—.0000" to .010"
- Spindle speeds, 16—40 to 2000 RPM
- Vertical capacity—28"
- Table travel—longitudinal 28"; cross 18"
- Table feeds—dial type, 16
- Table feeds—per minute, 5/16" to 20"
- Table rapid traverse—both directions 100"
- Horsepower—7½
- Weight—8100 lbs



W. B. KNIGHT MACHINERY CO.
3922 W. Pine Blvd. St. Louis 8, Mo.

1. A precision jig borer with extra talent!
2. Also handles an extreme range of difficult milling operations
3. Eliminates work transfers between jig borers and milling machines
4. Saves much of the layout work and preliminary drilling
5. Reduces job time up to 50% or more
6. Bed-type table guarantees greater rigidity and accuracy than knee-type

KNIGHT'S No. 50

Exclusive dial-controlled infinitely variable spindle feeds—Extra-long travel of the 1-piece roller bearing-mounted spindle increases capacity—Quick-action controls, all operated from 1 position—Rugged, rigid construction for accuracy—Power to spare—Many other time-and-money-saving features!

Write For Catalog!

THE
MACHINE TOOL
SHOW
CHICAGO, ILL.
SEPT. 9-17, 1955
INTERNATIONAL EMPLOYERS



ATTACH TO COMPANY LETTERHEAD

Please send catalog on No. 50 and other Knight boring and milling machines.

Name _____

Title _____

☐ Send information on Knight's 20" and 42" Rotary Tables

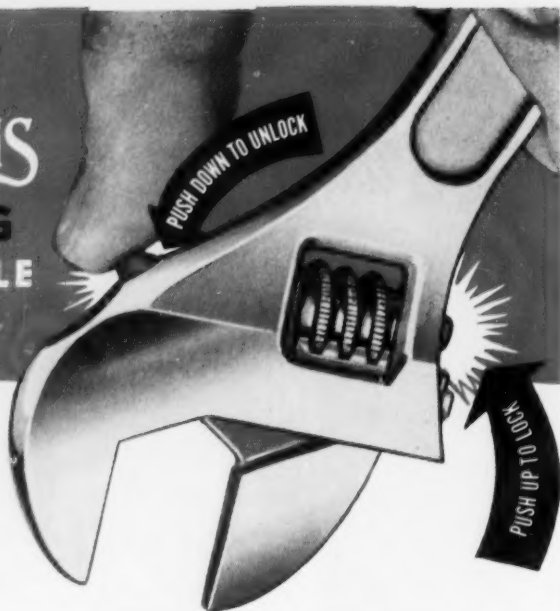
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NEW WILLIAMS LOCKING ADJUSTABLE WRENCH

with Features you
Have Always
Wanted in an
Adjustable Wrench

- No Obstructions
- Structurally Sound
- Positive Lock
- Rapid Adjustment
- One Hand Operation
- No Fumbling
- Drop-Forged from Selected Alloy steel and Chrome Plated

**AVAILABLE
AT NO EXTRA COST**



IN THREE MOST POPULAR SIZES

| No. | Size | Capacity | List Price |
|-----|------|-----------------|------------|
| 8L | 8" | 1 $\frac{5}{8}$ | \$2.45 |
| 10L | 10" | 1 $\frac{7}{8}$ | \$3.10 |
| 12L | 12" | 1 $\frac{3}{4}$ | \$4.50 |

WILLIAMS

INDUSTRIAL TOOLS

"The Broadest Line of Its Kind"

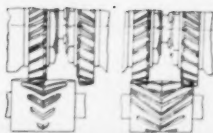
WRITE for descriptive folder No. A-465. Also ask for Catalog 302 showing the latest patterns and sizes in Williams broad line of industrial tools.



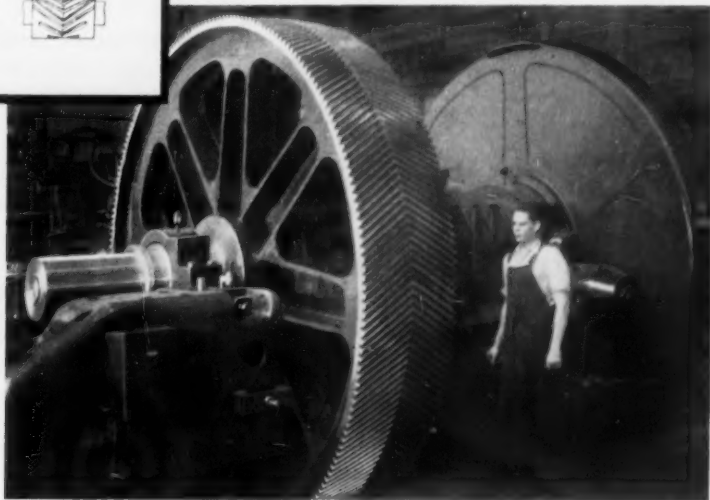
you'll get
SERVICE ON
THE DOUBLE
from your
DISTRIBUTOR'S
SALESMAN.
He'll give
you quickest
delivery at
lowest cost!

J. H. WILLIAMS & CO., 408 Vulcan Street, Buffalo 7, N. Y.

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The Farrel-Sykes machine has two cutters mounted on a single carriage. The cutters reciprocate, each ending its stroke at the center of the blank. As they cut, they twist to generate the helices and also slowly revolve in unison with the gear blank to generate the tooth contours precisely.



how precision gears get *Precision*

Precision comes to gears through the machine that makes them. It is passed on to Farrel® gears by the Farrel-Sykes Gear Generator, the operating principle of which (precision generation) gives the gears accurate tooth spacing, profile and helix angle. Because of this you can be sure that Farrel gears will operate smoothly, quietly and efficiently throughout a long service life.

Farrel continuous tooth herringbone gears are made in any size from 1/4" to 20'0" diameter, for any power

capacity and speed. Also available are straight tooth and single helical gears in sizes up to 20'0" in diameter, and large internal gears with either spur or helical teeth.

Farrel engineers will be glad to assist you in working out unusual gear problems.

FB-1014

FARREL-BIRMINGHAM COMPANY, INC. ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Boston, Akron, Detroit, Chicago, Memphis, Minneapolis, Fayetteville (N.C.), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

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fast

hone up to 1½ cu. in. per minute.

precision

tolerances as close as .0001 (±) on size, straightness and roundness.

CUT AWAY FERROUS & NON-FERROUS
METALS QUICKLY AND CHEAPLY WITH

FULMER

HONING MACHINES

Achieve amazing results each and every time! Cut labor costs . . . setting up time . . . any man can learn to operate FULMER HONING MACHINES in double-quick time. Photo taken in large steel mill.

WRITE for your copy of
bulletin on honing.

***Chips Run
as Large
as Six
Inches***

Stock is removed by
CUTTING
instead of
by slow,
laborious
abrasion.
True internal bores
up to
30 inch
diameter.

C. ALLEN FULMER CO.

1233 FIRST NATIONAL BANK BLDG.

CINCINNATI 2, OHIO

For more data circle 205 on Reader Service Card

6 modern machine shop

June, 1955



**do you have
OIL SEAL TROUBLES?**

SUPERFINISH **can solve them!**

Here's a typical case where a shaft with ground surfaces was driven at a speed of 1750 r.p.m. The oil seals created enough heat to burn the shaft and stop the motor. To make matters worse, it was found that twice the original speed was necessary. So, the oil seal surfaces were *Superfinished*, and the shaft operated at a speed of 3500 r.p.m. With the *Superfinished* surfaces, no heat was developed at this higher speed. No further trouble was encountered.

Superfinishing is a quick, simple and inexpensive process. Oil seal surfaces are but one of the many applications where it can save you money. Not only can it eliminate trouble, but often it can help you reduce manufacturing costs. Gisholt engineers can advise you regarding its applications.

Write now for the booklet
"Wear and Surface Finish."

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.



Superfinished ▶



◀ **Superfinished**

GISHOLT

MACHINE COMPANY

Madison 10, Wisconsin

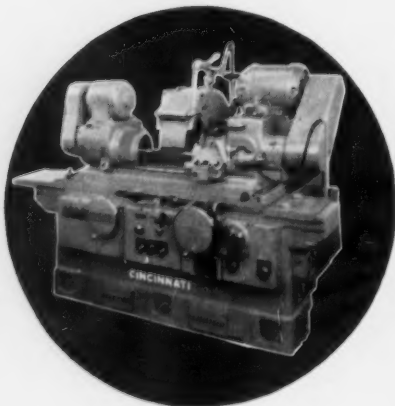
TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

Gap Eliminator*

Gets the Wheel to Work



*Patent applied for



GAP ELIMINATOR may be combined with Push-button Automatic Infeed and other cost-reducing features on CINCINNATI FILMATIC Grinding Machines like the 10" x 18" size illustrated above. You can obtain complete information by writing for publications No. G-603 and G-648.

How much time does your shop spend in grinding air? Too much, you can be sure, but it's not the fault of the workmen, for a certain amount of "cutting air" is a necessary evil in many machining operations. Cincinnati Grinding Engineers decided to do something about the time lost in grinding air during automatic infeed grinding cycles and developed the GAP ELIMINATOR, a new feature which may be built-in at the factory on automatic infeed machines. Briefly, here's how it works:

The wheelhead advances toward the work at a rapid rate. At a predetermined point (grinding stock on radius + .001") the rapid rate changes to a fast feed rate. Instantly upon contact of the wheel and work, the normal grinding rate takes over, and the cycle continues to completion.

For the example illustrated, the resulting saving amounted to 75% of the time spent in grinding air and 25.8% of the total cycle time. Time savings like this can mean big dollar savings on the cost records. It will pay the management of every metal-working shop concerned with precision grinding to find out more about the GAP ELIMINATOR feature available for CINCINNATI FILMATIC Grinders. Write for literature.

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO

CINCINN

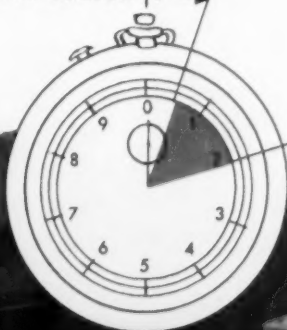
CENTERTYPE GRINDING MACHINES • CENTERLESS

on Faster Schedule

Time required for wheel to contact work at grinding rate.

GAP ELIMINATOR SCHEDULE

OLD
SCHEDULE



FILMATIC



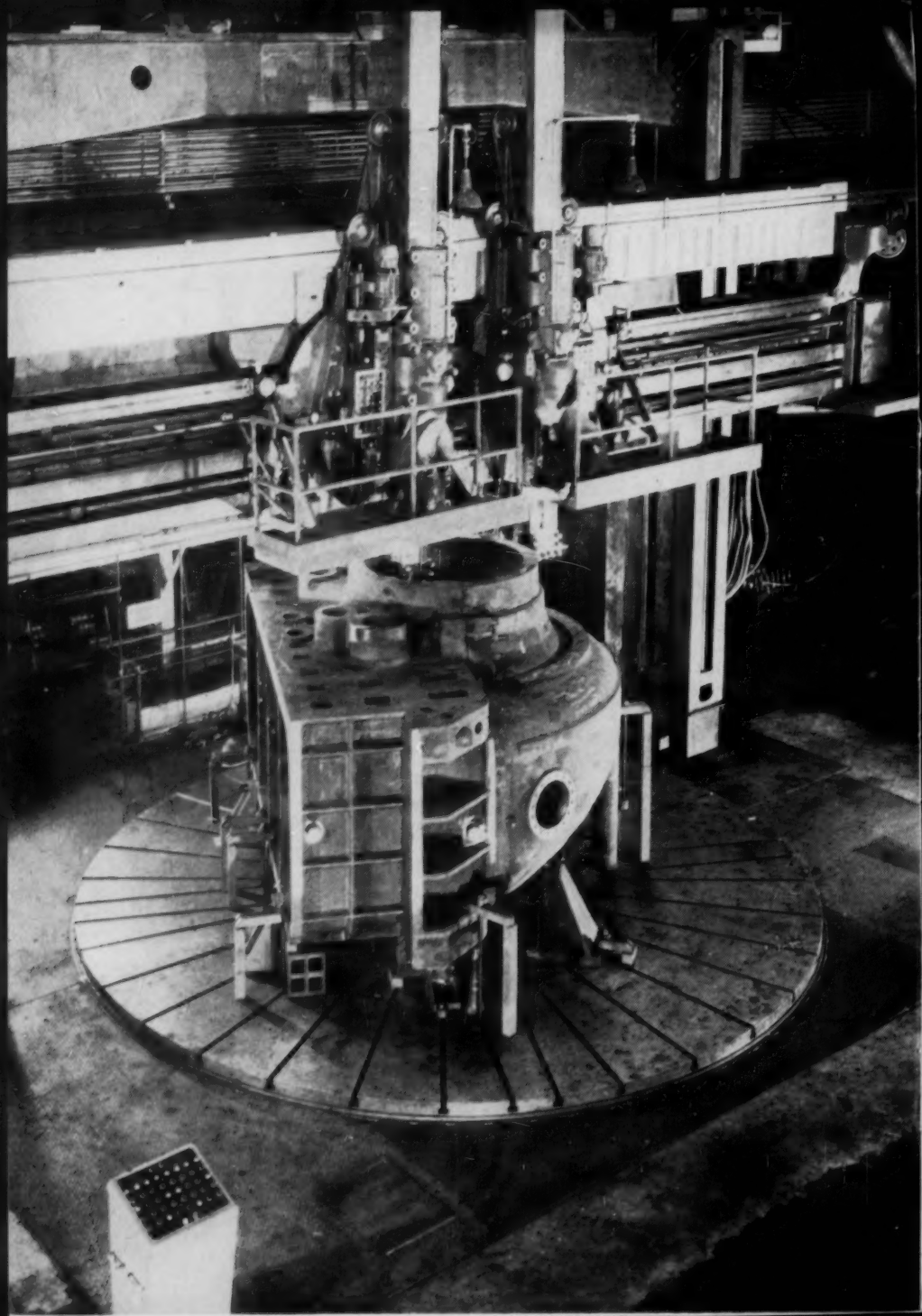
ATI

GRINDING MACHINES • CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES

For more data circle 208 on Reader Service Card

June, 1955

modern machine shop 9



Allis-Chalmers says:

"Our NILES 30 ft. boring mill will be modern for many years"

"Advanced controls and speed ranges which will remain modern for decades were what we wanted in a 30-foot boring mill," Allis-Chalmers reveals. "This Niles-built mill at work in our Milwaukee plant has fully met its high expectations.

"It is felt that its ruggedness and reliability will equal that of the 40-foot mill built by Niles in 1928 and in continuous operation at Allis-Chalmers for 25 years."

IT'S ONE OF THE MOST VERSATILE MACHINES EVER BUILT!

- Electrical control of all movements except where hand setting is desired
- 45-degree motor-operated swivel of boring bars
- Four station electrical control
- Detachable milling head
- Automatic warning of incorrect lubrication
- Maximum swing—30 feet, 5 inches
- Maximum height under tool—17 feet
- Bar travel—10 feet



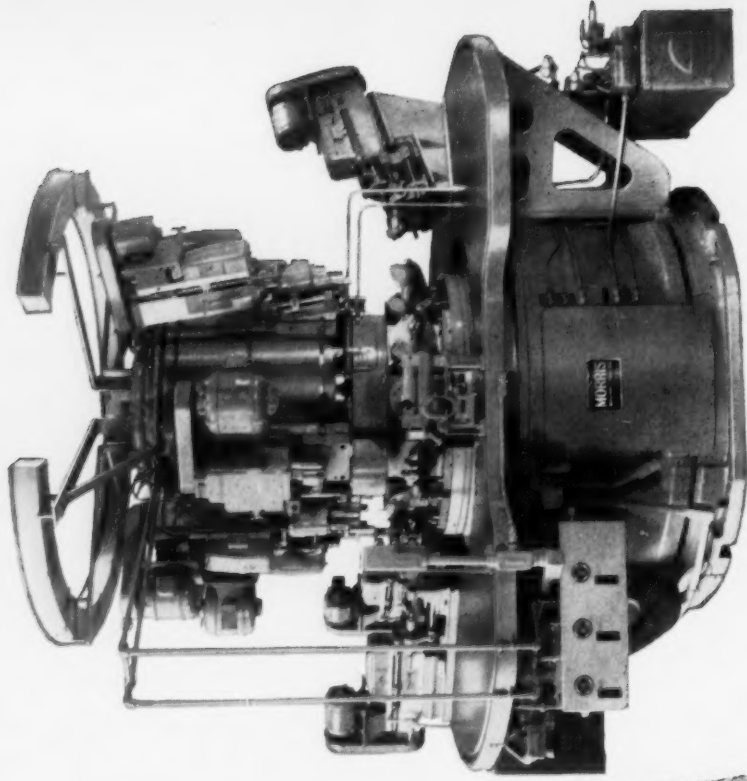
Hamilton Division, Hamilton, Ohio

BALDWIN-LIMA-HAMILTON



**Eliminates
model
change-over
problems!**

**a production
machine—with
standard units—
quick change-over
features—for each
year's design change.
completely automatic—
requires only part
loading and unloading.**



Morris Unit-Type Machine Tools provide specialized machining; use standard components; add flexibility to your high speed mass production operations.

Unit type construction provides for re-alignment for model alterations or for new models. No longer any need to scrap an entire machine!

MORRIS MOR-SPEED PRODUCTION MACHINE . . . drills, burrs, reams, taps, spotfaces carburetor air horns . . . 375 pieces per hour at 80% efficiency.

Basic construction provides a stationary center column and Morris AIR-OIL-MATIC Drill Units mounted on the column and on the removable platen. Parts are placed in air-power clamped fixture by the operator. The table indexes automatically through 12 stations, controlled by hydraulic indexing mechanism. 24 operations on 21 holes on 4 perpendicular faces and one angular face are performed on each piece. Operator merely loads unfinished pieces, unloads completed parts.

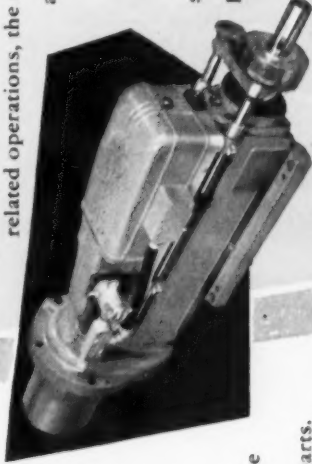
Write for new detailed descriptive literature . . . or outline your mass production problem involving drilling or related operations for prompt attention by MORRIS engineers.

MORRIS AIR-OIL-MATIC DRILL UNITS

- Adjustable Feed, Stroke and Rapid Approach
- Trouble-free Hydraulic System
- Wide Range of Spindle Speeds • Convenient Controls
- Air or Oil Powered • Hydraulically Controlled

Designed for a wide range of drilling, reaming, chamfering, spot-facing, hollow milling, centering and related operations, the unit can be mounted in vertical, angular or horizontal positions.

Controls may be set to provide almost any sequence of operation. Available for use in special purpose machines like the production machine illustrated.



VISIT US AT BOOTH #912
THE MACHINE TOOL SHOW
Chicago, Illinois, Sept. 6-17, 1955
International Amphibitheater



Morris

THE MORRIS MACHINE TOOL CO.
934 HARRIET STREET • CINCINNATI 3, OHIO

**Chips lodged
in wiping materials
injure hands...damage parts...**



...Another good reason for switching to **Scott Wipers!**

When a workman reaches for a clean, fresh Scott Wiper—he throws a *used* wiper and harmful chips away.

That means far less chance of injured hands and costly scratches and digs in finished parts.

Scott Wipers are two-ply and tough yet soft and absorb-

ent. Compare them with whatever wiping material you're using now—for cost, for convenience, for performance.

The Scott representative or distributor in your area will be glad to help you set up a production-line demonstration in your plant. Call him or mail this coupon today.

Scott Paper Company, Dept. MM-A, Chester, Pa.
Please send me full information on Scott Industrial Wipers.

Name

Company Position

Address

City State



For more data circle 214 on Reader Service Card

New

Metal-working



Series 90 Dyna-Shift



THE MACHINE TOOL SHOW
SEPTEMBER 6-8, 1983
MILWAUKEE, WISCONSIN

IT'S CHICAGO!

SEPT. 6 to 17

Don't miss the NMTBA's Machine Tool Show in Chicago—September 6 to 17 and don't, for better business' sake, miss our Monarch display there!

Object of the show, of course, is to demonstrate what the industry's best engineering brains have developed in the way of machines that lower costs by improving both output and accuracy.

We'll be there, for instance, with a great many new lathe improvements, including two freshly announced this year. Those would be our new Series 90 Dyna-Shift Heavy Duty Lathe, plus the new Series 62 Pre-

and so absolutely different as to defy comparison, they are two of many

techniques—

Series 90 Dyna-Shift Heavy Duty Lathe, plus the new Series 62 Pre-

Techniques—
for



Series 62 Preselector
Dyna-Shift



Business

and so absolutely different as to defy comparison, they are two of many reasons why you cannot afford to miss *the world's best investment—in action.*

We'll have more, too. And looking them over will be good for business—yours and ours, both. See you at the show! THE MONARCH MACHINE TOOL COMPANY, SIDNEY, OHIO.



Advance-
ment

Monarch
TURNING MACHINES
FOR A GOOD TURN FASTER TURN TO MONARCH



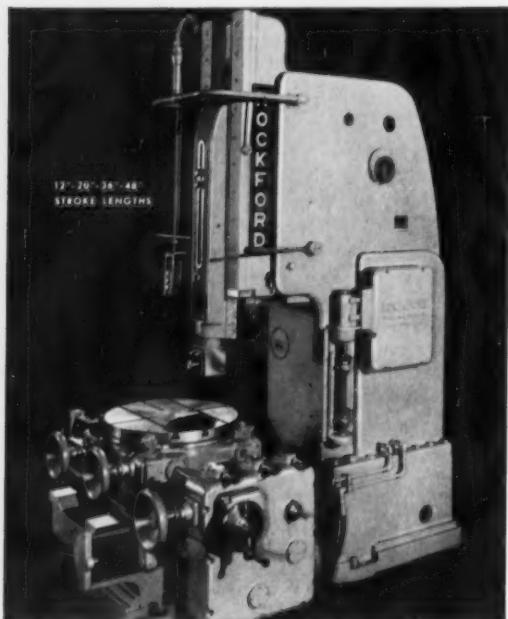
HYDRAULIC

fast, economical production calls for

HYDRAULIC

hydraulic slotters

HYDRAULIC



Hydraulic Drive is a natural for reciprocating-type machine tools. It provides smooth, powerful cutting, fewer moving parts, and longer useful life.

Hydraulic Slotters have power feeds and rapid traverse in all directions, and they may be equipped with Kopy-Kat Duplicators for fast, accurate duplicate machining. When you modernize your production facilities plan on Hydraulic Shapers, Planers and Slotters to provide the fastest, most economical production methods.

ROCKFORD MACHINE TOOL CO.

2500 Kishwaukee Street

Rockford, Illinois



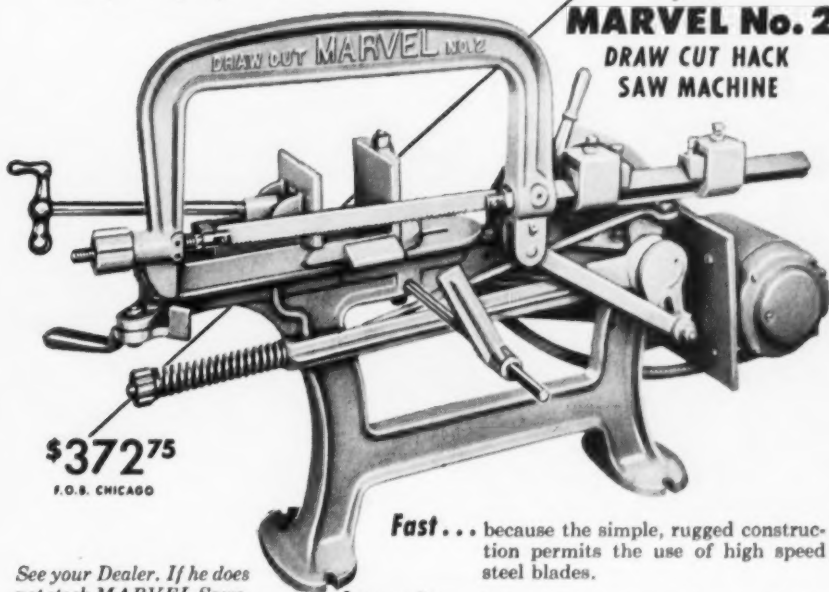
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For... General-Purpose Sawing

FAST-ACCURATE-ECONOMICAL-DRY CUTTING

Capacity up to 8" round

Improved
MARVEL No. 2
DRAW CUT HACK
SAW MACHINE



\$372⁷⁵

F.O.B. CHICAGO

See your Dealer. If he does not stock MARVEL Saws, he can get them quickly. Or simply write us for literature and delivery. When buying hack saw blades insist that your dealer furnishes genuine MARVEL High-Speed-Edge Hack Saw Blades—they are unbreakable!

Fast... because the simple, rugged construction permits the use of high speed steel blades.

Accurate... because the improved Saw Frame with clamping type blade holders holds the blade in perfect alignment and proper tension.

Economical... because of its automatic relief on the return stroke, the blade will last and last and last.

Dry Cutting... because modern high speed steel blades will operate efficiently at 60 strokes per minute without a coolant.



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SAVE TIME IN TRACING,



TURNING, FACING

with **Hydra-Trace*** and your **LeBlond** lathe!

Check the job list of most any LeBlond Lathe—Hydra-Trace combination. You'll find it turning complex dies in the morning, step shafts in the afternoon. Yesterday, it was contour facing compressor discs; tomorrow, turning bevel gear blanks. And saving time on every one!

Hydra-Trace can be mounted in place of the compound rest on most any LeBlond Lathe . . . in minutes. It swivels to the most favorable angle for proper tool clearance. Its flat template is easily made, conveniently stored. Template holder and all controls are neatly located at front of lathe. And you can remove Hydra-Trace to use your lathe for other work in practically no time at all!

For complete data on Hydra-Trace, ask for Bulletin HT-2A

American Brass saves 91% of a 6-hour job!

Turning mandrels shaped like baseball bats (used in drawing seamless tubing) ate up 6 hours of lathe and operator time at The American Brass Co., Waterbury, Conn. With Hydra-Trace installed on their LeBlond 16" x 78" HD lathe, it's done in 30 minutes! And the same lathe, with Hydra-Trace removed, is still available for regular turning, facing and chasing!

If variety is important in your lathe operations, you can't do better than Hydra-Trace and a LeBlond lathe. We'll tell you promptly whether Hydra-Trace will fit the LeBlond you have. Or we can recommend *exactly* the right combination for your requirements from scores of lathe sizes and models. See your LeBlond Distributor or write Cincinnati today.

THE R. K. LEBLOND MACHINE TOOL CO., CINCINNATI 8, OHIO

*Hydra-Trace (Trade Mark registered U. S. Pat. Off.) is LeBlond's heavy-duty hydraulic tracing attachment. Can be mounted in place of compound rest on practically all LeBlond lathes built since 1935.

... cut with confidence



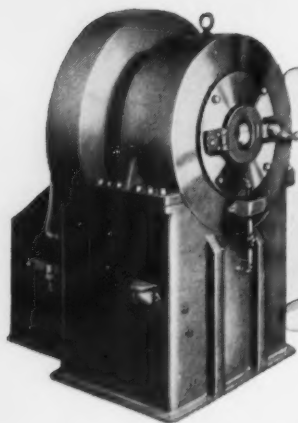
Be sure to see LeBlond, Booth 1313



World's Largest Builder of a Complete Line of Lathes • For More than 68 Years
For more data circle 220 on Reader Service Card

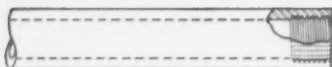
June, 1955

modern machine shop 21

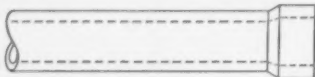


Swaging Success Stories

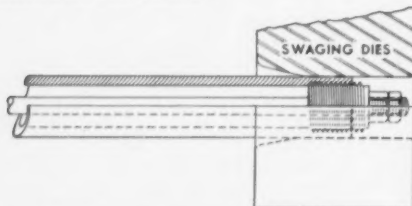
Forming Internal Threads ...by Swaging



The internal threads on this tube were formed quickly and economically by swaging over a mandrel



First the end of the tube was expanded to receive a mandrel of the same diameter as the desired thread.



With the mandrel in place, the expanded section was then swaged to its original OD and the mandrel unscrewed. Result: Accurate internal threads with quality and finish of expensive machined threads. Uniformity from piece to piece was excellent.

Mandrel swaging can be used to form internal threads with practically all metals. It is particularly advantageous when working with aluminum and other metals that are difficult to machine.

Swaging can be your key to time and cost savings!

1. It's fast—often the fastest way to get a forming or finishing job done.
2. It's easy—can be done with unskilled labor.
3. It's economical—eliminates expensive machining operations without sacrificing quality.

Write for our informative booklet on swaging. It contains detailed descriptions of the Torrington Rotary Swagers. It also may carry the key to a "swaging success story" in your own plant.



THE TORRINGTON COMPANY

Swager Department
730 North Street, Torrington, Conn.
Makers of Torrington Needle Bearings

TORRINGTON ROTARY SWAGING MACHINES

For more data circle 221 on Reader Service Card



"Here's why GISHOLT insists upon the **HEAVIEST CASTINGS!**"

Look at them . . . castings for the heaviest saddle type turret lathes in the business! Look at all the angles:

First, note how the headstock is cast integrally with the bed for perfect spindle alignment. . . how cross supports give the most solid base for carriages, tools and slides. . . how extra-heavy webbing gives the headstock the ruggedness to support powerful gear train members.

Remember, too, that cast iron absorbs vibration. The heavier the better! And Gisholt controls the quality of the finest nickel semi-steel in its own foundry.



The Gisholt 5L Saddle Type Turret Lathe has a net weight of 22,500 lb. without equipment.

What does it mean to you? You can load up your Gisholts with carbides and really turn out the chips! You've got the strength, the rigidity and the freedom from vibration to take all the speed you can get from today's carbides—with the heaviest feeds—and still have the safety margin to take care of tomorrow's tool bit developments.

GISHOLT

MACHINE COMPANY

Madison 10, Wisconsin

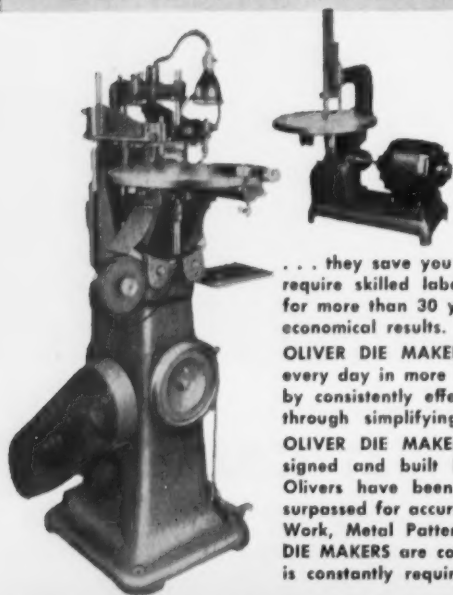
THE GISHOLT ROUND TABLE

represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.



TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

HIGH PRODUCTION COSTS! **ECONOMIZE with** **OLIVER DIE MAKING MACHINES**



High and unnecessary die making costs will be eliminated . . . production schedules and higher product standards maintained . . . when you equip your toolroom with **OLIVER DIE MAKING MACHINES**. With an Oliver in your service, smoother production will be assured . . . higher output certain . . . lower die making costs a fact!

OLIVER DIE MAKERS are **ECONOMICAL** . . . they save you time . . . are easy to operate . . . do not require skilled labor. Many plants have been using Olivers for more than 30 years because they produce dies with more economical results.

OLIVER DIE MAKERS are **EFFICIENT** . . . prove themselves every day in more than 10,000 installations around the world by consistently effecting cost reductions of as much as 60% through simplifying sawing, filing and lapping operations. **OLIVER DIE MAKERS** are **ACCURATE** . . . engineered, designed and built by Oliver of Adrian, the precision-made Olivers have been tried and tested for four decades. Unsurpassed for accuracy on Dies, Production Filing, Experimental Work, Metal Patterns, Cams, Gages and Templates, **OLIVER DIE MAKERS** are considered essential wherever precision work is constantly required.

Oliver Die Makers available in 5 models —

The Bench Model 5-1 (illustrated) is a single speed die maker for use on tool steel up to 1" thick.

The Heavy Duty Model (illustrated) has 6 speeds, works in metal up to 3" thick, has variable strokes to 5" with hydraulic feed.

**Write Today For Complete Technical Data on
OLIVER DIE MAKERS**

See our catalog in Sweet's Directory

MACHINE TOOLS by OLIVER include:

**AUTOMATIC DRILL GRINDERS
TOOL & CUTTER GRINDERS
DRILL POINT THINNERS
TEMPLATE TOOL GRINDERS
FACE MILL GRINDERS
DIE MAKING MACHINES**

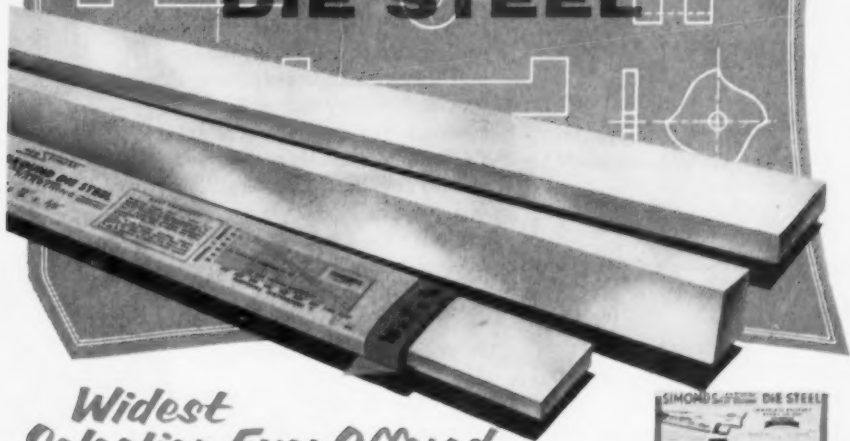
OLIVER INSTRUMENT CO.

1430 E. MAUMEE • ADRIAN, MICHIGAN

For more data circle 223 on Reader Service Card

1911

Hundreds of New Stock Sizes **SIMONDS** Flat Ground **DIE STEEL**



Widest Selection Ever Offered

Now you can get hundreds of new stock sizes of Simonds high-grade, precision-ground tool and die steel. Sizes that formerly were special are now available from stock at regular prices. Sizes you asked for to help you save time and money. "1001 sizes for 1001 uses" in either OIL or AIR Hardening type steel.

OIL HARDENING TYPE — Non-deforming, spheroidize-annealed for best machinability and consistently uniform hardenability — from Simonds' own steel mill. Extra-smooth finish with all decarburization and surface defects removed. Wide hardening range. Individually packaged (18" and 36" lengths) with simplified heat treating instructions.

AIR HARDENING TYPE — Non-deforming, spheroidize-annealed, 5% chrome — more wear-resistant yet easy to machine and heat treat with uniformly excellent results — another product of Simonds' steel mill. Extra-smooth finish with all decarburization and surface defects removed. Wide hardening range. 36" lengths. Individually packaged with heat treating instructions.



**FREE
WALL
CHART**

Ask your Simonds Distributor for a copy of this New Chart (18" x 21") giving full range of Stock Sizes now available.

**For Fast Service
from
Complete Stocks**



**Call your
SIMONDS
Industrial Supply
DISTRIBUTOR**

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon.
Canadian Factory in Montreal, Que. Simonds Divisions: Simonds Steel Mill, Lockport, N. Y.
Simonds Abrasive Co., Philadelphia, Pa., and Ardenne, Que., Canada



For more data circle 224 on Reader Service Card

June, 1955

modern machine shop 25

ALL NEW

Lodge & Shipley

10" HI-TURN LATHE

PERFECTED FOR PRODUCTION!

...never before...so many features...

so much quality...at such low cost!

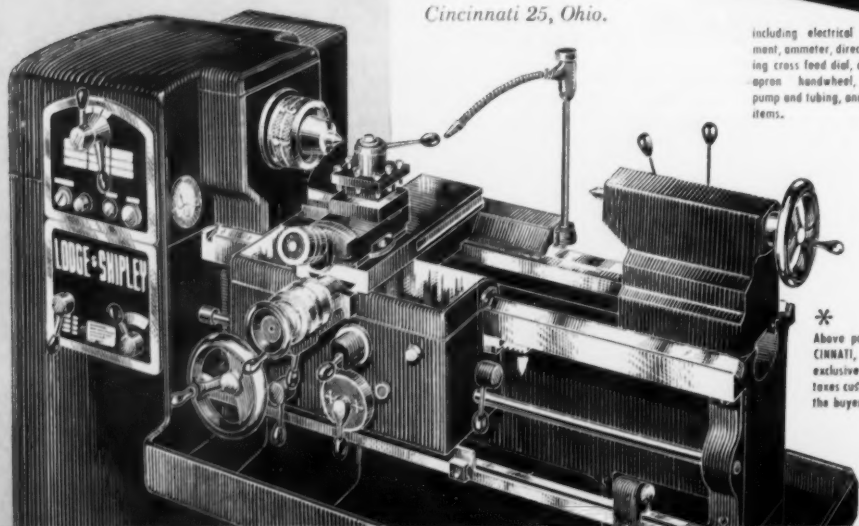
- 9 color-coded speeds up to 3000 RPM and 5 HP
- Totally enclosed quick change gear box
- Dynamically braked motor in leg
- Template-type length stops, magnetic clutch operated
- Flame-hardened replaceable steel bedways
- Hardened and ground cross slide ways
- Direct reading cross feed and top slide dials
- Provision for rear tool block and multiple tools

The Lodge & Shipley 10" HI-TURN Lathe is a completely new concept in lathes. Establishing that lathes for high speed production rarely utilized lead-screws, Lodge & Shipley eliminated the leadscrew and its complicated gearing . . . added other features for high production and accuracy at low cost. The result is a rugged lathe of high efficiency at a price substantially lower than conventional lathes.

Write for detailed Bulletin 300,
The Lodge & Shipley Co.,
3055 Colerain Avenue,
Cincinnati 25, Ohio.

only
\$4,985*

including electrical equipment, ammeter, direct reading cross feed dial, dial for apron handwheel, pan, pump and tubing, and other items.

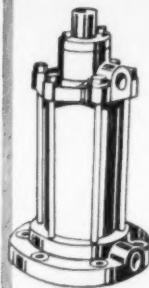


*

Above price is for CINCINNATI, OHIO and is exclusive of applicable taxes customarily paid by the buyer.

SEE IT NOW! and SEE IT AT THE MACHINE TOOL SHOW, SEPTEMBER 6-17

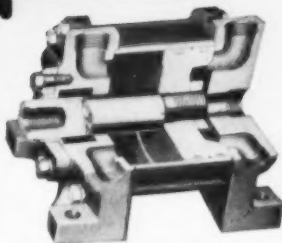
Logan HYDRAULIC CYLINDERS



750 SERIES NONROTATING TYPE 7 STANDARD MOUNTINGS

Eight standard sizes from 2" to 8" diameter bore. Maximum operating pressure 750 psi.

Covers chrome nickel cast iron. Large outlet and inlet for rapid action. Bronze packing glands. Steel packing gland caps. Hydraulic-type V-ring packing. Honed, seamless steel tube. Step cut-type piston rings. Piston chrome nickel cast iron. Multiple pipe connections for convenient installation.



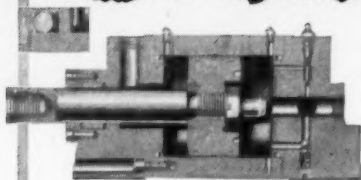
Check the many outstanding features of the Logan hydraulic double-acting, nonrotating-type cylinder as indicated in the above cross-section. They ensure continuous service under most severe operating conditions.

Logan 750 Series and Rotating Hydraulic Cylinders are the result of nearly forty years' experience in the development and manufacture of hydraulic equipment. They are today providing high operating efficiency in thousands of plants.

ROTATING "RR" TYPE

Seven standard sizes from 3" to 14" diameter bore. Maximum operating pressure 500 psi.

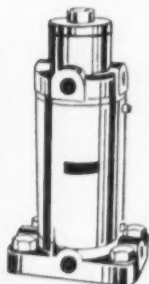
ROTOCAST® SERIES 7 STANDARD MOUNTINGS



Sizes from 2" to 8" bore; any length stroke up to 8 feet as standard. Four piston rod end types. Operating pressures to 1500 psi.

Note features as shown in cross-section. Ground and polished alloy steel piston rod. Bronze packing gland bushing. Self-adjusting hydraulic packing. Synthetic

seal rings (see enlargement). Close-fitting pilot for centering piston on piston ring. Nut securely locked to prevent loosening of piston. Close-grained cast piston of ample length to provide necessary bearing and strength. Cushion check valve of ample size to prevent quick start of piston travel. Optional ports. Adjustable cushion speed valve. Automotive-type piston rings. Air vent valves. Centrifugally cast iron cylinder tube retains smooth, accurate bore. Large ports for unrestricted oil flow. There are no hydraulic cylinders more dependable than Logan Rotocast.



Let Logan engineers help you design your Air and Hydraulic Circuits.

MEMBER—
National Tool Builders
Assoc., National Fluid
Power Assoc.

LOGAN MANUFACTURES 7023 STANDARD CATALOGED ITEMS

FREE CATALOG ON REQUEST

AIR CONTROL VALVES, Cat. 108-4 • AIR CHUCKS, Cat. 70-1 • AIR CYLINDERS, Cat. 100-1 • AIR-DRAG CYLINDERS, Cat. 100-3
AIR and HYDRAULIC PRESSES, Cat. 51 • COLLET GRIP TUBE FITTINGS, Cat. 200-5 • HYDRAULIC CONTROL VALVES, Cat. 200-4
HYDRAULIC CYLINDERS, Cats. 200-2, 200-3 • HYDRAULIC POWER UNITS, Cat. 200-1 • SURE FLOW COOLANT PUMPS, Cat. 62



LOGANSPOUT MACHINE CO., INC., 801 CENTER AVE., LOGANSPOUT, IND.

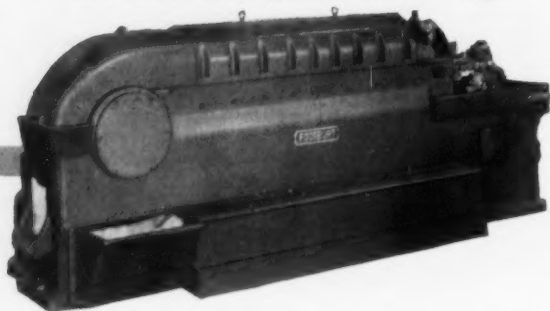
For more data circle 226 on Reader Service Card



Lower Cost

per piece with

Surface Broaching
of small parts



■ Holding fixtures are designed for quick, convenient loading, with automatic clamping and unclamping

■ In many plants where large quantities of duplicate metal parts are being machined, substantial savings are being made through the adoption of surface broaching. Production is exceptionally high, close tolerances are maintained, and tool maintenance costs are much lower than with ordinary methods. Foote-Burt engineers, pioneers in this advanced machining method, have had a wide experience in applying surface broaching in many fields.

THE FOOTE-BURT COMPANY

Cleveland 8, Ohio

Detroit Office: General Motors Building

** engineered
for
production*

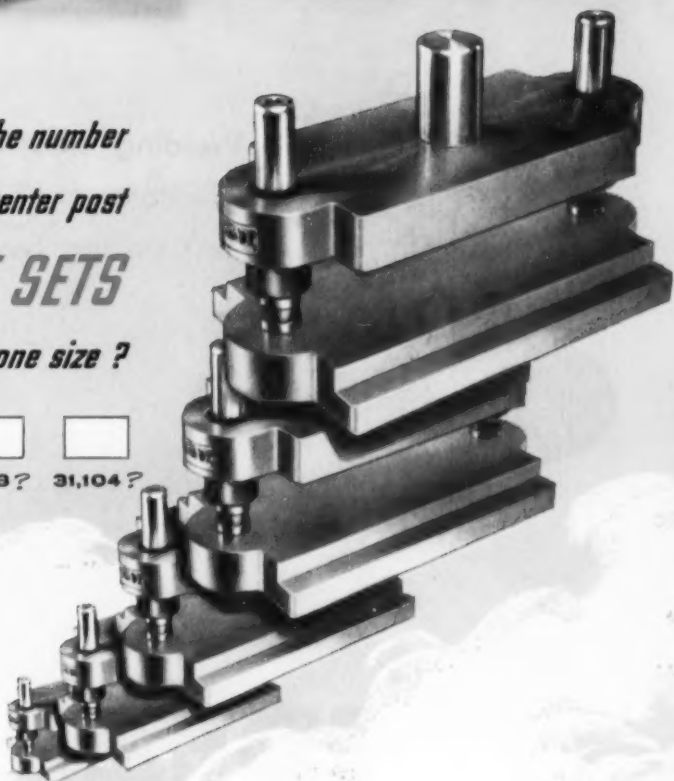
FOOTBURT

PIONEERS IN SURFACE BROACHING

For more data circle 227 on Reader Service Card

*can you guess the number
of different center post
DANLY DIE SETS
in stock—in just one size ?*

☐ ☐ ☐ ☐
67 ? 575 ? 1433 ? 31,104 ?



3 different punch
holder thicknesses



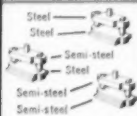
3 different die
shoe thicknesses



6 shank size
variations



4 bushing type
variations



3 different material
combinations



16 guide post lengths
in each of
3 different styles
to choose from

If you guessed 31,104 different standard center post Danly Die Sets in just one size . . . then you were right! Simply multiply together all of the variation possibilities shown in a Danly Catalog for a 12x12 standard center post precision Danly Die Set, and you'll get this remarkable figure. Even more remarkable is the fact that *all* of these variations are cataloged and *stocked* in every Danly Branch.

Just how does this benefit you? This almost unlimited variety of Standard Danly Die Sets in stock at your Danly Branch is your assurance that you can always get the die set you want . . . *when* you want it. That's important in saving tooling time. So remember, when you want the best in die sets—*fast*—the place to call is your local Danly Branch.

DANLY MACHINE SPECIALTIES, INC.
2501 South Laramie Avenue, Chicago 50, Illinois

Choose the Danly Branch closest to you:

BUFFALO 7
1807 Elmwood Avenue

CHICAGO 50
2100 S. Laramie Avenue
113 Michigan Street, N.W.

CLEVELAND 14
1550 East 33rd Street

DAYTON 7
3196 Delphos Avenue

DETROIT 16
1549 Temple Avenue

GRAND RAPIDS
113 Michigan Street, N.W.

INDIANAPOLIS 4
5 West 10th Street

LONG ISLAND CITY 1
47-28 37th Street

LOS ANGELES 54
Ducommun Metals & Supply Co.,
4890 South Alameda

MILWAUKEE 2
111 E. Wisconsin Avenue

PHILADELPHIA 40
511 W. Courtland Street

ROCHESTER 6
33 Rutter Street

ST. LOUIS 8
3740 Washington Blvd.

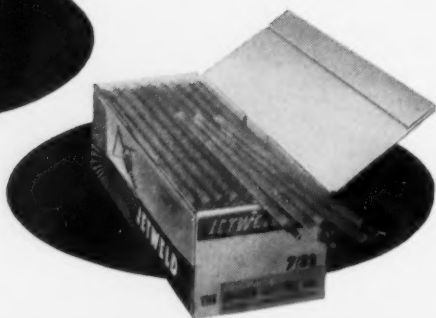
SYRACUSE 4
2005 West Genesee Street

DANLY

DIE SETS . . .
STANDARD OR SPECIAL
DIEMAKERS SUPPLIES



Welding industry's
greatest
cost-cutting twins . . .



IDEALARC *and* JETWELD

Never before has any combination of welder and electrode offered such a cost-saving potential in faster, easier welding. Here's why:

Idealarc for easy, efficient operation . . . first welder to give you *both* AC AND DC WELDING CURRENT with Dual Arc Control where you select "soft arc" or "forceful arc" on AC as well as DC and in addition . . . hot starting on DC as well as AC

Jetweld for high-speed operation . . . first universally adopted iron-powder electrode for extra-fast welding high deposition drag operation

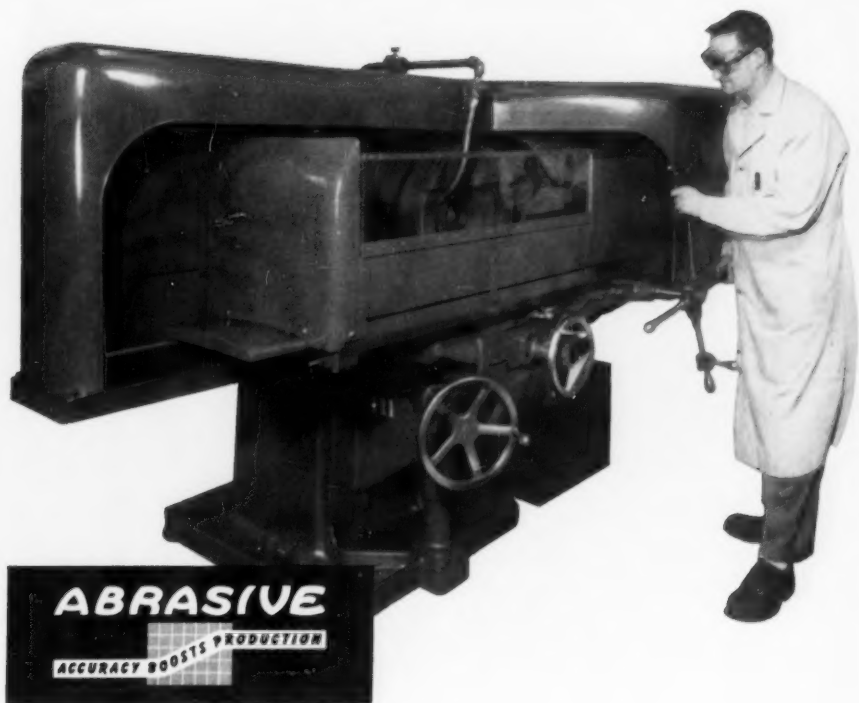
LET LINCOLN DEMONSTRATE HOW YOU CAN PROFIT . . . NOW. Send for Bulletin 1343. Write . . .

THE LINCOLN ELECTRIC COMPANY

Dept. 3502 • Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

For more data circle 229 on Reader Service Card



**This rugged, powerful face grinder
is used by the largest auto body
manufacturer in the world . . .**

Find out why!

For 18" Face Grinder Bulletin, write Abrasive Machine Tool Co., 20 Dunellen Road, East Providence 14, R. I.

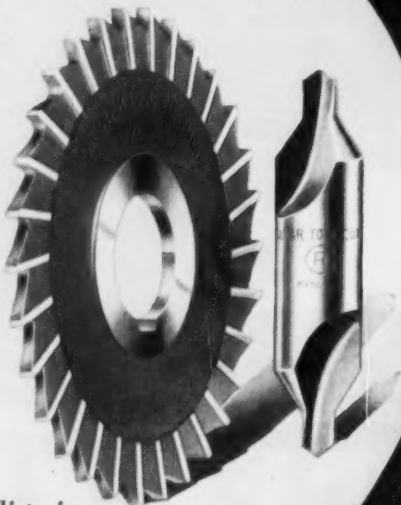
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Have you seen

Our NEW CATALOG N?



In our definitive new catalog you'll find Circle R products pictured and fully described, with size and price listings, ordering instructions, and helpful data on speeds and feeds for most effective metal cutting. As specialists, we make nothing but circular metal cutting tools — the finest you can buy, though they cost no more. We are consultants on metal-cutting problems throughout industry, with particular reference to the new problems of automation. Ask for your free reference copy of Catalog N. Write direct or contact our Circle R Specialists in your district.



... Consult

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CIRCULAR TOOL CO., INC.

PROVIDENCE 5, RHODE ISLAND

Specialists in
Circular Cutting Tools Since 1923

METAL SLITTING SAWS
COPPER SLITTING SAWS
SCREW SLOTTING SAWS
COMMUTATOR SLOTTING SAWS
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CUT OFF SAWS • CIRCULAR
KNIVES & ROTARY SHEAR
BLADES • CIRCOLOY STEEL
SAWS • SOLID & TIPPED
TUNGSTEN CARBIDE SAWS
COMBINED DRILLS & COUNT-
ERSINKS • CENTER REAMERS

For more data circle 231 on Reader Service Card

PRATT & WHITNEY

TRI-ROLL *Thread Comparators*

SOLVE *ANOTHER* QUALITY CONTROL PROBLEM *Requiring:*

A COMPLETE FUNCTIONAL THREAD CHECK...

This requirement in the Quality Control system of a large manufacturer of high quality screw thread fastenings was met by using full length gaging rolls. Errors in lead, angle and pitch diameter are read cumulatively; taper and out-of-round also detected.

PLUS A CRITICAL PITCH DIAMETER CHECK . . .

accomplished by using two-ribbed rolls truncated to $\frac{3}{8}$ pitch crest flat and cleared root.

for a WIDE RANGE OF PRODUCT SIZES . . .

Even the largest, special screw threads are gaged rapidly, accurately and economically. Adaptation requires only simple fixtures.

LET P&W HELP WITH YOUR QUALITY CONTROL PROBLEMS

Use the coupon below to send for Tri-Roll Circular No. 570 . . . or write on your company letterhead outlining your gaging requirements.



PRATT & WHITNEY

DIVISION NILES-BEMENT-POND COMPANY

25 Charter Oak Blvd., West Hartford, Connecticut

Please send my free copy of Circular No. 570

NAME

POSITION

COMPANY

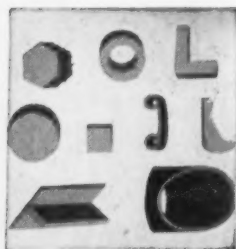
CO. ADDRESS

CITY ZONE STATE

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THE CINCINNATI
Wet Abrasive
Cut-Off Machine



Cut Down ON **CUT-OFF TIME!**

Cut any metal, solids or tubing fast and accurately! Capacity up to 2¼" in solids, 3½" in tubing. Straight or angle cuts up to 45°. And look at these speeds: 2" bar stock in 15 seconds . . . 2" tubing, 3/32" wall, in 10 seconds . . . 2" angle iron, ⅛" thick, 45° angle, in eight seconds. Special features include Cincinnati's exclusive water nozzle, insuring proper coolant flow for longer wheel life; and foot-operated vise, freeing operator's hands for faster production.

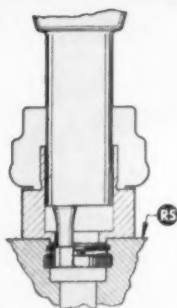
Write today for Bulletin 55-JA

MFRS. OF DRILLS, GRINDERS, BUFFERS AND PORTABLE TOOLS

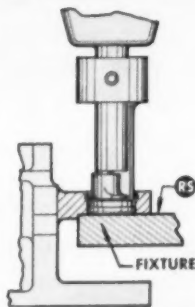
TRADE *The Cincinnati* MARK
THE CINCINNATI ELECTRICAL TOOL CO.
Division of THE R. K. LeBLOND MACHINE TOOL CO.
CINCINNATI 8, OHIO, U. S. A.

For more data circle 233 on Reader Service Card

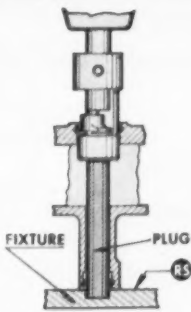
Even Unskilled Labor Can Use This Versatile Tool Accurately! It Simplifies Internal Grooving Problems, Cuts Production Costs!



A) Cuts two grooves of different depths and widths in one single operation from same reference surface.



B) Cuts groove in bore located in protruding member of workpiece. Reference surface on under side of protrusion.



C) Cuts grooves in two bores of different diameters from same reference surface. Tool banks on reference surface. Then workpiece is reversed and tool banks on plug.

Amazingly versatile! Your toughest recess cutting problems can be met simply and efficiently with the Waldes Truarc Grooving Tool because it offers a whole range of possibilities beyond the range of ordinary recessing tools.

Wide Cutting Range! The Waldes Truarc Grooving Tool comes in 5 models...enabling you to cut accurate grooves in housings with diameters from .250 to 5.00 inches.

Send Your Problems to Waldes! Send us your blueprints...let Waldes Truarc Engineers give you a complete analysis, price quotation and delivery information on the most economical tool set-up for your particular job. There is no obligation!

Write NOW for a 20-page manual containing full information on Waldes Truarc Grooving Tool



WALDES
TRUARC
GROOVING TOOL

Made by the Manufacturers of Waldes Truarc Retaining Rings
WALDES KOHINOOR, INC., 47-16 Austel Place, L.I.C. 1, N.Y.
Waldes Truarc Grooving Tool Manufactured
Under U. S. Pat. 2,411,426

Waldes Kohinoor, Inc., 47-16 Austel Pl., L.I.C. 1, N. Y.
Please send me your new 20-page technical manual
on the Waldes Truarc Grooving Tool.

Name _____

Title _____

Company _____

Address _____

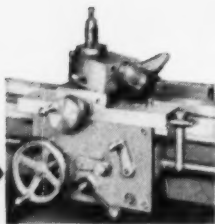
City _____ Zone _____ State _____

For more data Circle 234 on Reader Service Card

from its big
ball-bearing
spindle



. . . . to the
precision
carriage



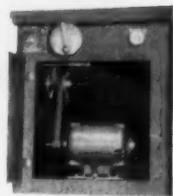
along its
rugged, accurate bed



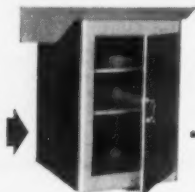
to the
tailstock . .



. . . . and down to the
variable speed drive . . .

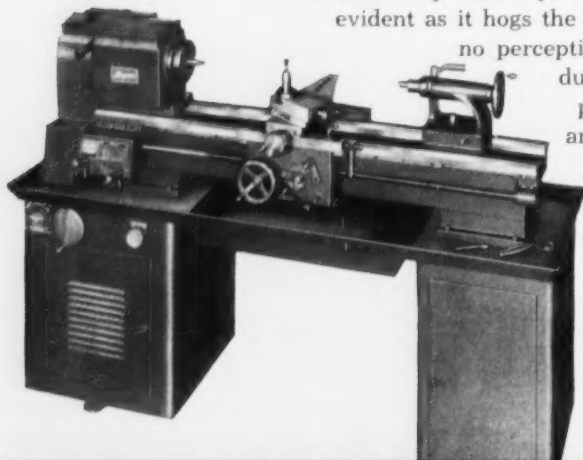


and its solid, strong,
convenient cabinet



. . . . the No. 6560
Logan 14" Lathe is

ruggedly proportioned, precision
built and dynamically balanced. Its superiority is
evident as it hogs the heavy cuts with almost
no perceptible vibration, and pro-
duces precision results in
production, maintenance
and tool room operations.
At your Logan dealer's.
Write for Bulletin 14-L.



SPECIFICATIONS AND FEATURES

14 $\frac{1}{2}$ " swing over bed
9" swing over saddle
1 $\frac{1}{2}$ " spindle hole
1" collet capacity
40" between centers
Variable Speed Drive
Ball Bearing Spindle
38 to 1200 rpm

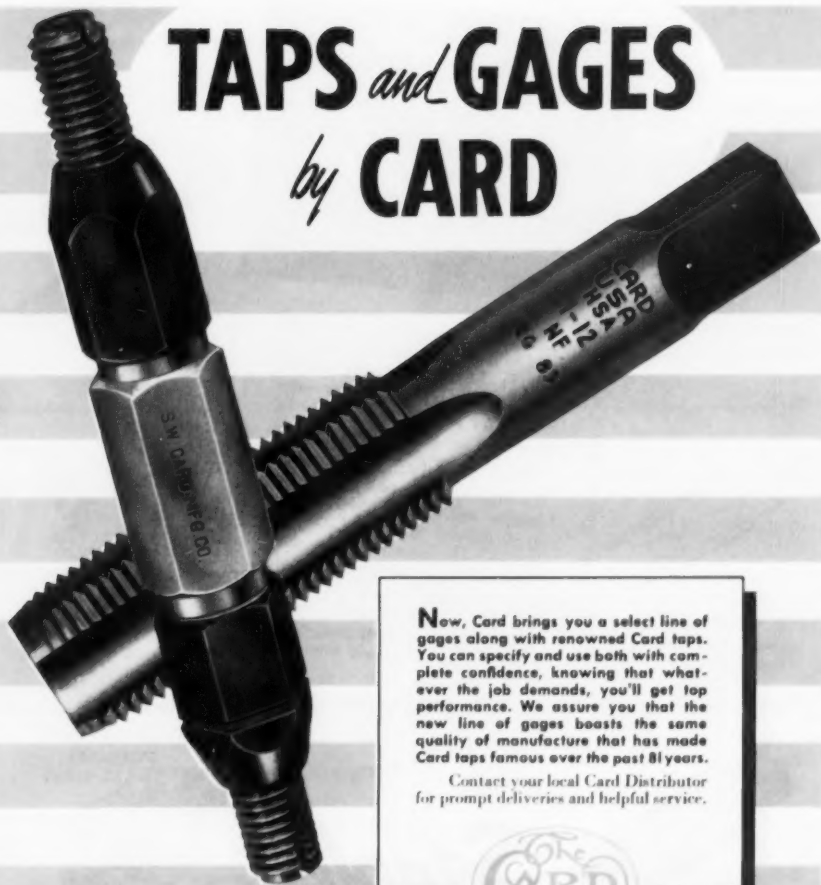
LOGAN ENGINEERING CO.

4901 WEST LAWRENCE AVENUE

• CHICAGO 30, ILLINOIS

For more data circle 235 on Reader Service Card

TAPS *and* GAGES *by* CARD



New, Card brings you a select line of gages along with renowned Card taps. You can specify and use both with complete confidence, knowing that whatever the job demands, you'll get top performance. We assure you that the new line of gages boasts the same quality of manufacture that has made Card taps famous over the past 81 years.


Contact your local Card Distributor for prompt deliveries and helpful service.



S. W. CARD MANUFACTURING CO. MANSFIELD, MASS.

Division of Union Twist Drill Co. TAPS • DIES • SCREW PLATES • GAGES

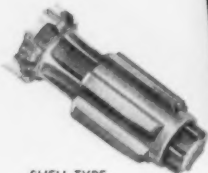
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SOLID CHUCKING
REAMERS




EXPANSION REAMERS



SHELL-TYPE
EXPANSION REAMERS



CORE DRILLS



STUB SCREW MACHINE
REAMERS (SOLID AND
EXPANSION TYPES)



SHELL END MILLS



END MILLS



COUNTERBORES,
SPOTFACERS

each a specialist
in cost cutting

Staples

CARBIDE-TIPPED CIRCULAR TOOLS

Your economy begins — and work quality improves—when you specify Staples carbide-tipped circular tools. They have established an enviable reputation throughout industry for delivering top-profit performance on every job.

A complete range of standard tool designs and sizes is available for quick delivery from stock. For your special tools, submit your specifications and prints for a prompt quotation. You'll be making the most of your standard and special tool investment when you put Staples Tools to work in your production.

Staples

CARBIDE-TIPPED CUTTING TOOLS

A complete line of Circular Carbide-Tipped Tools, Expansion Reamers — Special Tools

Write for the Staples
Standard Tool Catalog

THE STAPLES TOOL COMPANY, CINCINNATI 25, OHIO

For more data circle 237 on Reader Service Card

Your Best Buy in a

HYDRAULIC SURFACE GRINDER

BOYAR-SCHULTZ 6x12

*
\$1380⁰⁰

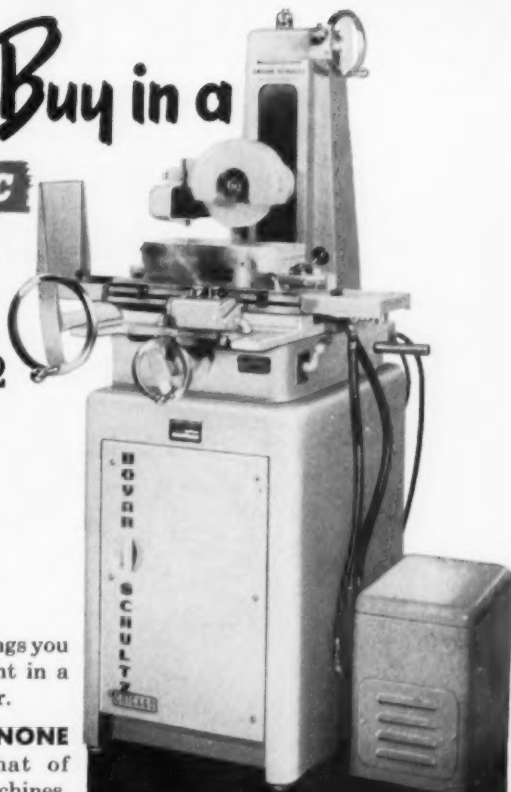
LOW COST investment brings you the latest development in a 6 x 12 Surface Grinder.

ACCURACY SECOND TO NONE — comparable to that of larger, more costly machines.

STURDINESS — maintains close tolerance precision over long production runs.

New Hydraulic valve, designed and developed by Boyar-Schultz engineers, affords perfect reciprocating longitudinal movement.

*Including stand — other accessories optional at additional cost.



Please Rush Information on Your
HYDRAULIC 6 x 12 SURFACE GRINDER

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____

STATE _____

BOYAR-SCHULTZ CORPORATION

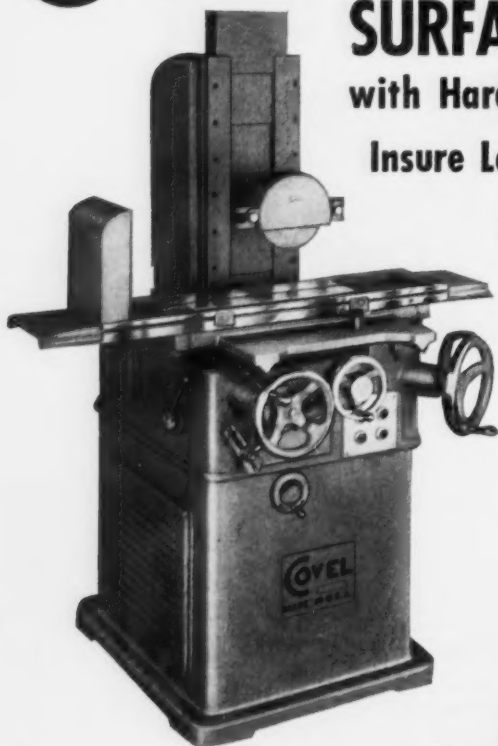
2020 SOUTH 25TH AVE. • BROADVIEW, ILL.

For more data circle 238 on Reader Service Card

COVEL No.10 ^{6" x 18"} **HAND OR POWER FEED** **SURFACE GRINDERS** with Hard Chrome Table Ways Insure Long-Lasting Accuracy...

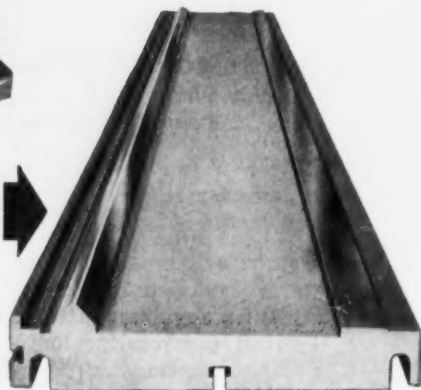
Lower Costs

Replace old, inaccurate grinders now with this low-priced, precision-built, easy-to-operate grinder with latest bed-type construction. Cut manufacturing and maintenance costs on gage, form tool and all-around tool room grinding.



Hard Chrome Table Ways Reduce Maintenance Costs

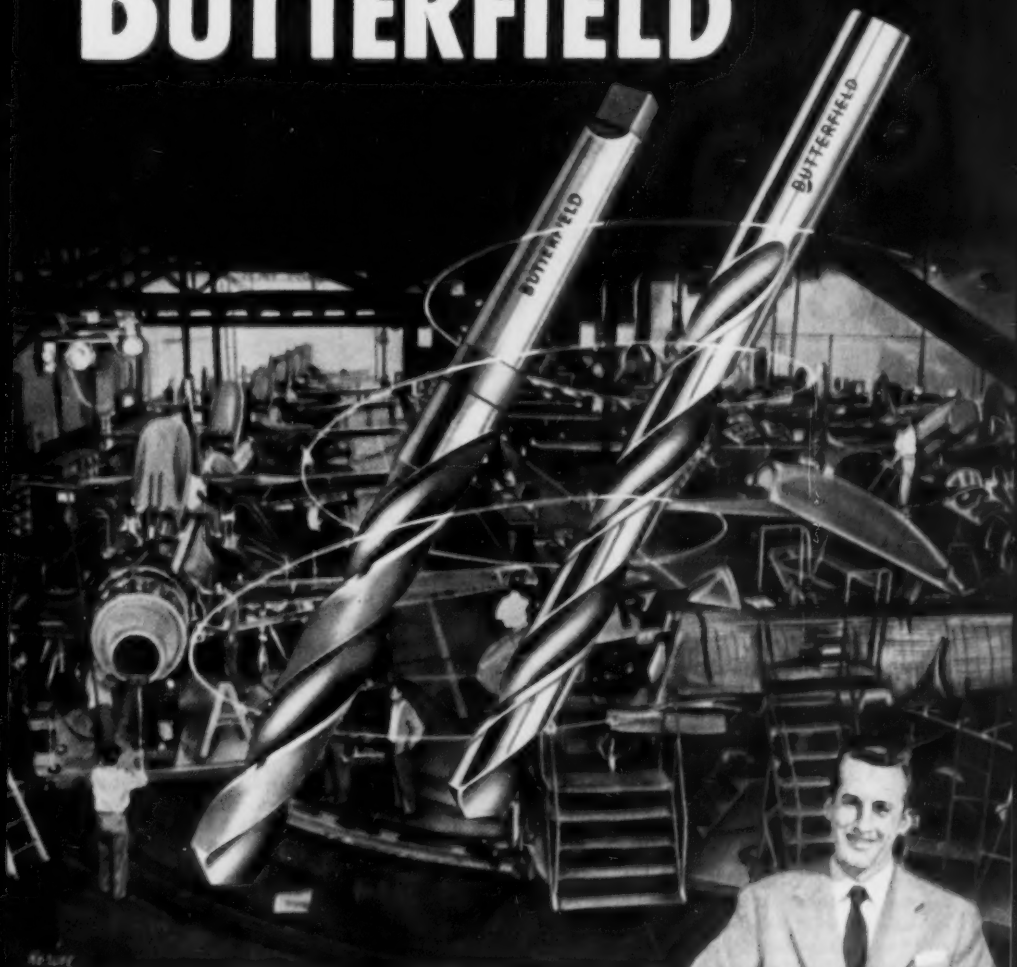
Expensive, time-consuming rescraping of ways is eliminated through Covels special plating process. The Vee and flat ways on tables in service over five years, finished with this wear-resistant surface, show very slight wear, no flaking and no loss of the original built-in precision. Send for descriptive Bulletin M-65.



COVEL **PRECISION GRINDERS** **BENTON HARBOR MICHIGAN**

For more data circle 239 on Reader Service Card

BUTTERFIELD



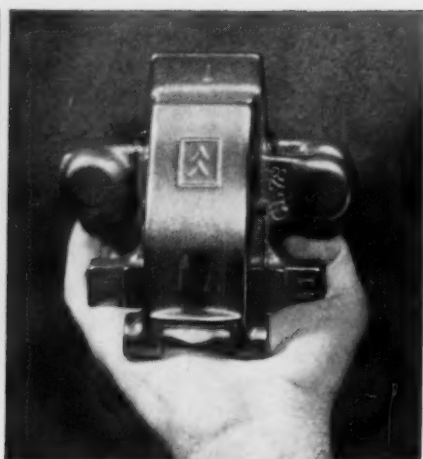
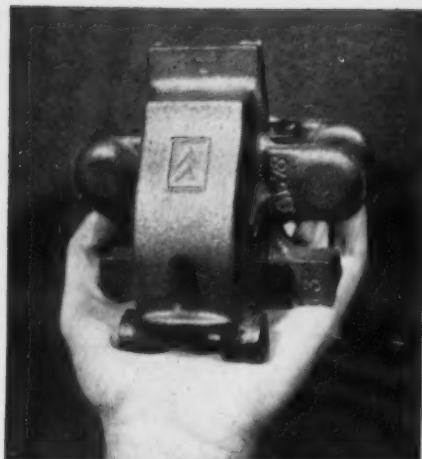
A COMPLETE LINE OF QUALITY cutting

tools is now available from your Butterfield distributor. Drills are made to the same exacting standards as Butterfield Milling Cutters, Taps, Dies, Reamers, Counterbores and End Mills.

UNION TWIST DRILL COMPANY
BUTTERFIELD DIVISION
DERBY LINE, VERMONT, U. S. A.

FOR FAST, ECONOMICAL SERVICE
CALL YOUR **BUTTERFIELD**
DISTRIBUTOR





Identical castings, before and after barrel finishing with Norton ALUNDUM abrasive. Completely finishing this irregularly shaped part by hand would have taken much longer, with less uniform finishing of the many hard-to-reach spots.

ALUNDUM* tumbling abrasive tames another tough one!

*Intricate parts finished faster, more thoroughly,
when Norton abrasive adds the "TOUCH OF GOLD"*

The trickier, more intricate the parts, the easier it is to see the many advantages of barrel finishing with ALUNDUM tumbling abrasive. Hand finishing the casting illustrated, for example, would have been a long, tiresome chore — and an uneven job at best, due to the many irregularities of shape.

For parts ranging from even heftier castings down to tiny needles, there's nothing like ALUNDUM abrasive to bring out *all* the benefits of barrel finishing. This typical Norton abrasive development is sharp, dense, hard and non-fracturing. Its blocky shape eliminates slivers and chips in the tumbling process. In your tumbling barrels it assures:

- Highest uniformity of radii and surfaces, with brightest, smoothest finish.

- Continual savings of man-hours, by reducing tumbling cycles, scrap and reworking to minimum.

See Your Norton Distributor

for further facts on how ALUNDUM abrasive can add the time-saving, profit-boosting "Touch of Gold" to your finishing operations. Ask him for the new 55-page booklet on barrel finishing. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone book, yellow pages. Export: Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

G 288

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries



*Making better products...
to make your products better*

and its BEHR-MANNING division

NORTON COMPANY: Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes

For more data circle 241 on Reader Service Card

Here's Your Best Assurance of

Higher Output Better Accuracy Reduced Costs

On Every Boring
and Facing
Operation

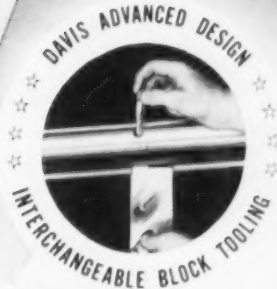
SOLID BLOCK
CUTTER

MULTI-CUTTER BLOCK
WITH EXPANDABLE
CUTTERS

With only two items to handle
—block and taper lock
screw—it takes but a few
seconds to insert a Davis block
in its bar and start boring.

MICROMETER-ADJUSTABLE
SINGLE-CUTTER
BLOCK

TWO-CUTTER
BLOCK WITH
EXPANDABLE
CUTTERS



**ONLY DAVIS
GIVES YOU ALL**

8 OF THESE ADVANTAGES

1. Block centers accurately in bar.
2. Full thrust transmitted to bar.
3. Readily adjusts to float boring.
4. Cutters rigidly locked in block.
5. Assure maximum range of bore sizes.
6. Blocks feature built-in centers.
7. Fore or back bore with one tool.
8. Quick, easy changing of blocks.

FOR COMPLETE INFORMATION,
WRITE FOR DAVIS CATALOG 304

All 4 Block Styles Fit into the Same Bar Slot

Every boring job in your shop goes faster, more accurately and shows up far better on cost records when you standardize on Davis block tooling.

Truer bores result from exclusive design features and simplified, precision construction. The unique Davis double-piloted, taper lock screw is unequalled for accurate centering of block and transmission of full boring thrust to the bar slot. Rigidly supported and locked cutters assure higher accuracy on even heaviest cuts.

Faster, more economical boring results from the complete interchangeability of the Davis block line. Four basic block styles can be used in any particular bar slot—and changing blocks is simpler and faster than any other method. Bring your boring operations up to date—write now for complete information on how Davis Interchangeable Block Tooling can save you time, money and rejects.

DAVIS



BORING TOOL DIVISION OF
Giddings & Lewis Machine Tool Co.
Fond du Lac, Wisconsin

THE ONE NAME THAT CERTIFIES ULTIMATE PRECISION AND PRODUCTIVITY IN TOOLING

**"King-size"
turning jobs
call for
Nebel power,
speed and
accuracy**

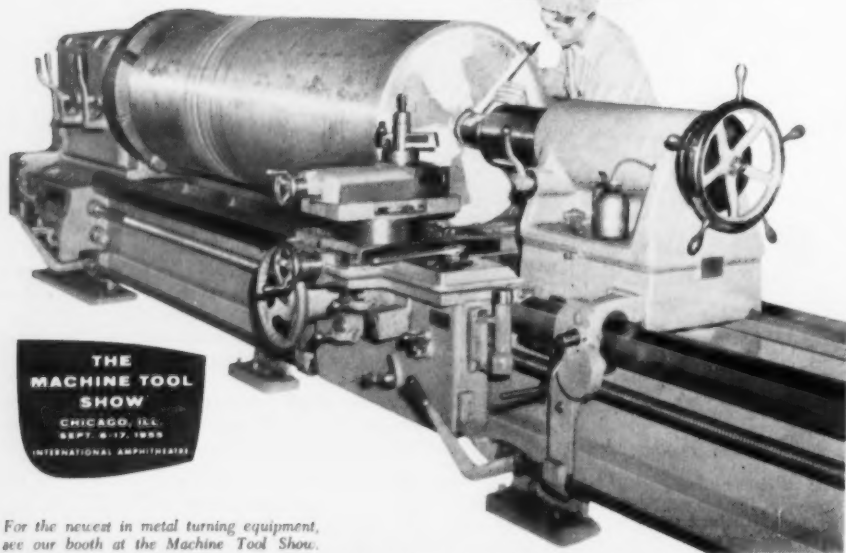
You need the ample facilities of Nebel lathes to turn heavy jobs like this huge steel mill roll. The 36" Nebel 'F' series heavy duty engine lathe—shown on the job at Lukens Steel Company, Coatesville, Pa.—has the stamina to support such enormous loads...and the power to turn them *quickly and accurately* day after day.

Secret of Nebel performance is in the Nebel engineered headstock — now equipped with shaved and hardened steel gears and Timken anti-friction bearings throughout.

Performance plus price. Only Nebel brings you the combination of outstanding performance and low price. Nebel engine lathes are made in six swing sizes, 16" to 36". Write today for descriptive bulletins.

The Nebel Machine Tool Co.
3409 Central Parkway, Cincinnati 25, Ohio

Nebel
LATHES
CINCINNATI



For the newest in metal turning equipment,
see our booth at the Machine Tool Show.

For more data circle 243 on Reader Service Card



How to have **2** strings to your bow...

... **SWITCH TO CIMCOOL®**, the radically new and different coolant that has become, in a few years, the largest selling chemical-lubricant cutting fluid in the world. Here are two big advantages of CIMCOOL Standard Concentrate over old-fashioned cutting fluids:

CIMCOOL DOES A BETTER JOB because of its chemical lubricity. It permits faster speeds and increases tool life, for it combines friction reduction and cooling capacity in a degree never before attained.

CIMCOOL LOWERS COSTS because it lasts longer in machines. Thus, it reduces downtime and cuts labor costs for cleaning and changing.

For information on the many specific advantages of CIMCOOL Standard Concentrate—or details on the entire family of CIMCOOL Cutting Fluids—just contact us. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

® Trade Mark Reg. U.S. Pat. Off.

CIMCOOL CUTTING FLUIDS

CIMCOOL Standard Concentrate—The famous pink fluid which still covers 85% of all metal cutting jobs.

CIMCOOL S-2 Concentrate—For heavy duty use.

CIMCOOL Water Conditioner—For increased rust control.

CIMCOOL Tapping Compound—Increases tap life amazingly.

CIMCOOL Transparent Grinding Fluid—Superior rust control at high dilutions.

CIMCUT Base Additive—For jobs requiring an oil-base coolant.

CIMCOOL "CI"—The cutting fluid developed especially for cast iron with exceptional rust control properties.

CIMCOOL Machine Cleaner—The 2-phase non-corrosive cleaner that cuts grit, dirt, slime and oil.

CIMCOOL Bactericide—The most effective agent yet developed to overcome rancidity and foul odors.

CIMCOOL
Cutting Fluids

100%
for ~~85%~~ of all metal cutting jobs

PRODUCTION-PROVED PRODUCTS OF THE CINCINNATI MILLING MACHINE CO.

*If WEAR
is a factor...*

...use



CARBIDE PLUG GAGES

TUNGSTEN CARBIDE

wire type .016" to .500" dia.

CHROME CARBIDE

taper insert type .500" to 1.510" dia.

In addition to its regular line of tungsten carbide wire type plug gages from .016" to .500" diameter, The Van Keuren Company now offers a new line of chrome carbide taper insert plug gages in the range from .500" to 1.510" dia. Van Keuren tungsten carbide wire type gages have proved their worth on thousands of tough gaging jobs. The new chrome carbide taper inserts (Carboloy, grade #608*) promise to be equally effective. Wearing qualities of chrome

*Trademark of the Carboloy Dept. of General Electric Co.

carbide are comparable with tungsten carbide. In addition, the material is lighter than tungsten carbide and has a coefficient of expansion close to that of steel . . . both of which factors are a distinct advantage in the larger sizes. **Finish on Van Keuren gages in either tungsten carbide or chrome carbide will average .5 RMS or better.** These gages are available in Class Y, X and XX accuracies at moderate prices and on a reasonable delivery basis.

Send for a copy of the 220-page Van Keuren Catalog and Hand Book No. 35 containing valuable technical and engineering information on measuring problems and methods. Address: The Van Keuren Co., 175 Waltham St., Watertown, Mass.



THE *Van Keuren* co.,

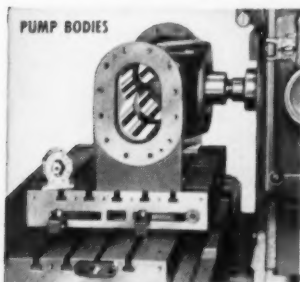
175 WALTHAM STREET, WATERTOWN, MASS.

Light Wave Equipment • Light Wave Micrometers • Gage Blocks • Taper Insert Plug Gages • Wire Type Plug Gages • Measuring Wires • Thread Measuring Wires • Gear Measuring System • Shop Triangles • Carboloy Cemented Carbide Plug Gages • Carboloy Cemented Carbide Measuring Wires • Chrome Carbide Taper Insert Plug Gages

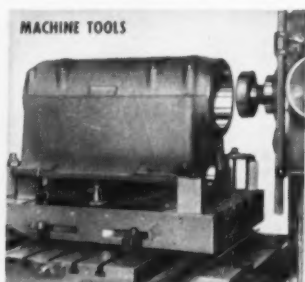


For more data circle 245 on Reader Service Card

The De Vlieg System of
***JIGLESS PRODUCTION**
... eliminates expensive boring jigs!

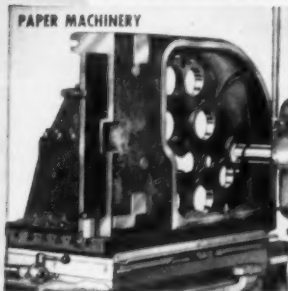


PUMP BODIES



MACHINE TOOLS

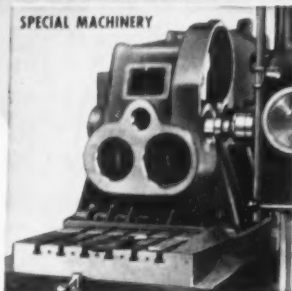
TYPICAL EXAMPLES OF JIGLESS PRODUCTION ON DE Vlieg JIGMILS



PAPER MACHINERY

The
JIGMIL Technique:

- ELIMINATES SPECIAL BORING JIGS
- REDUCES MACHINING TIMES
- PERMITS USE OF SIMPLIFIED TOOLING
- IMPROVES ACCURACY WITH RESULTANT CUT IN ASSEMBLY COSTS

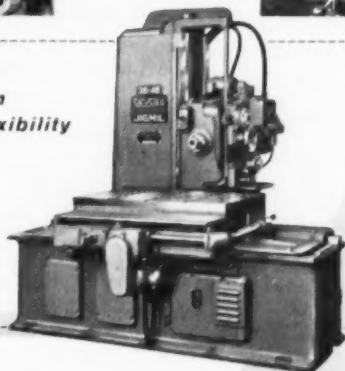


SPECIAL MACHINERY

The De Vlieg System of Jigless Production permits complete flexibility of product design!

If your shop is burdened with costly boring jigs and special tooling, it will pay you to investigate the

De Vlieg SPIRAMATIC JIGMIL



****Come to Detroit-***

see a practical demonstration of the JIGMIL TECHNIQUE

Write for comprehensive Illustrated Catalog

De Vlieg MACHINE COMPANY

450 Fair Ave., Ferndale • Detroit 20, Mich.

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A BIT OF BALANCE

Try it
and get more
for your money

du MONT

**High Speed, Ground
Square and Rectangular
TOOL BITS**

have the wear resistance,
toughness and red hardness
precisely balanced so that
you get *more cuts per bit and
per dollar.*

They keep a keener cutting
edge over a longer period.

Make your own performance
tests and cost comparisons
and you'll specify du Mont
H. S. Tool Bits from then on.

The du MONT CORPORATION,
Greenfield, Mass.

MAIL FREE Tool Bit COMPARISON
CHART, CATALOG and PRICE LIST
\$ to

Name

Company

Address

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Meetings

Important Meeting Dates

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

June 7-10 • American Welding Society, National Spring Meeting, Hotel Muehlebach, Kansas City, Mo. Society headquarters: 33 W. 29th St., New York 19, New York.

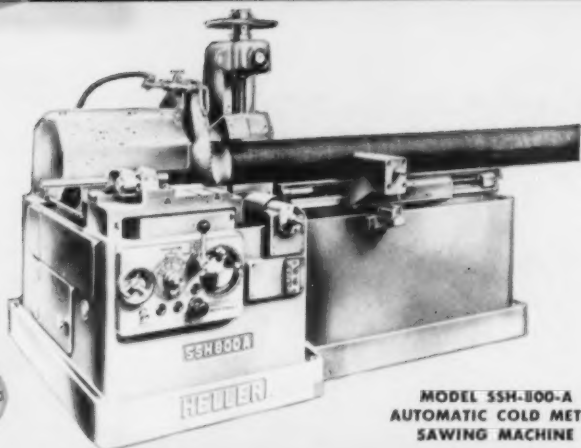
June 14-17 • Second Annual Cornell University Industrial Engineering Seminars, Cornell University, Ithaca, N. Y. Information: Andrew Schultz, Jr., Department of Industrial and Engineering Administration, Cornell University.

July 12-14 • Second Annual Western Plant Maintenance and Engineering Show, Pan Pacific Auditorium, Los Angeles. Information: Clapp & Poliak, Inc., 341 Madison Ave., New York 17, New York.

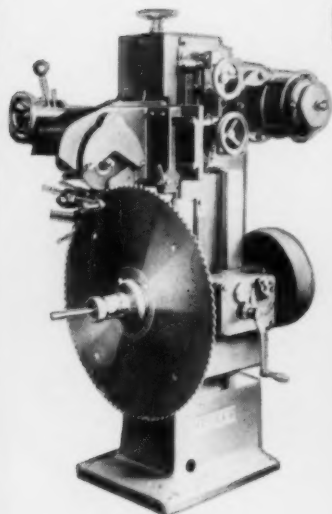
September 6-17 • National Machine Tool Builders' Association, Machine Tool Show, International Amphitheatre, Chicago. Association headquarters: 2071 E. 102nd St., Cleveland 6, Ohio.

September 6-17 • Production Engineering Show, Navy Pier, Chicago. Information: Clapp & Poliak, Inc., 341 Madison Ave., New York 17, New York.

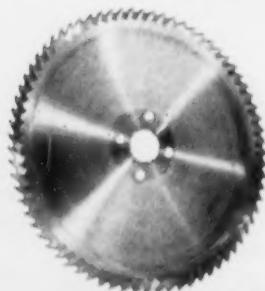
September 6-17 • Coliseum Machinery Show, Chicago Coliseum, Chicago. Information: Exhibition and Convention Management, Inc., 2689 E. Overlook Rd., Cleveland 6, Ohio.



MODEL SSH-800-A
AUTOMATIC COLD METAL
SAWING MACHINE



MODEL B-650
AUTOMATIC SAW SHARPENING
MACHINE



HELLER GIVES YOU COMPLETE SERVICE
WITH EXACTLY CORRECT BLADES.

**CENTRALIZED
RESPONSIBILITY**
assures
TRIPLE ECONOMY
with **HELLER**

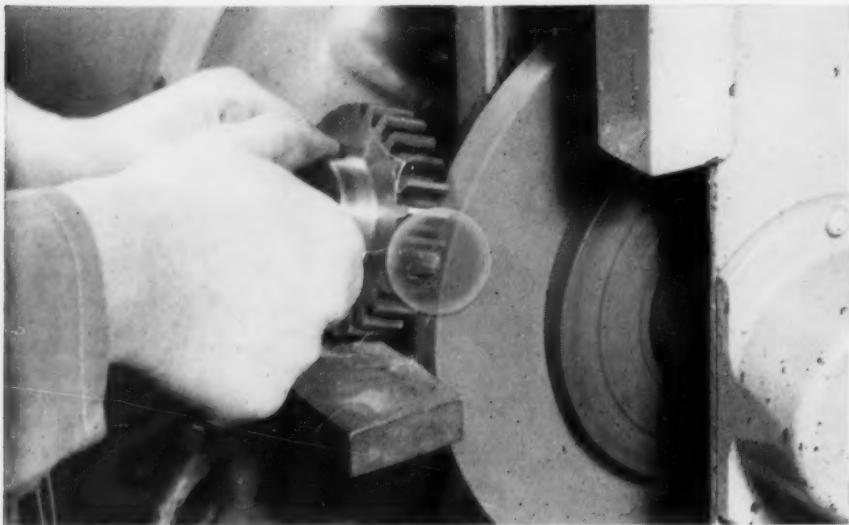
1. The Cold Sawing Machine
2. The Blade Sharpener
3. The Circular Sawblade

Economies are effected on every operation involved in cold metal sawing by taking advantage of the complete service available through Heller.

The specific savings offered by use of the combination of Heller Cold Metal Saws, Heller Blade Sharpeners and recommended Sawblades becomes accumulative when used with each other.

HELLER MACHINE COMPANY, 114 Liberty St., New York 6, N. Y.

**KNEE AND PLANNER TYPE MILLING MACHINES • RADIAL AND COLUMN
DRILLING MACHINES • TRANSFER MACHINES • SPECIAL MACHINES**



BF A universal favorite for removing light welds, breaking edges on machined work, deburring, taking off flash from plastic parts and many other light portable and bench grinding operations. To be used on periphery only.

The jobs they do! The money they save!

Norton Reinforced Wheels add the "TOUCH of GOLD"

to countless everyday grinding jobs

With Norton Reinforced Wheels you get extra-long service life, exceptional strength and fast, cool, trouble-free grinding — the Norton-engineered "Touch of Gold" that saves you money in the widest range of routine grinding jobs, from light deburring to heavy cutting-off.

To this top grinding performance Norton Reinforced Wheels add a wide margin of safety. All four are resinoid bonded and reinforced by layers of tough fabric molded into them. As follows:

BF — *Semi-flexible straight wheel, cotton fabric reinforcement. Also available in mounted wheels and points and hand sticks.*

BN — *Straight wheel with glass cloth reinforcement. Primarily a cut-off wheel, its rough,*

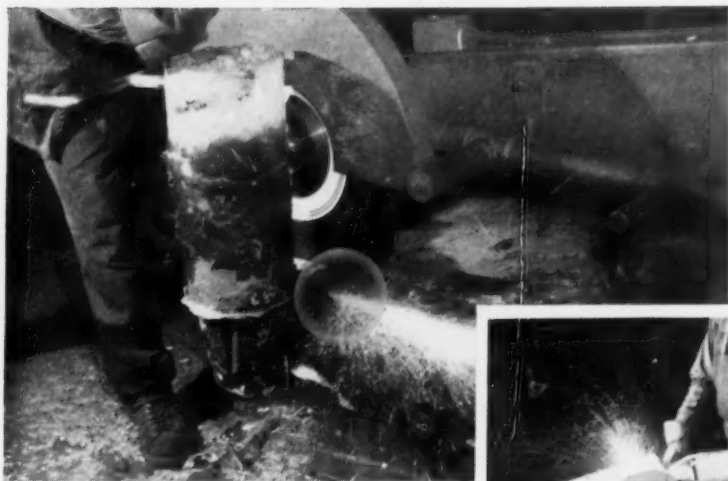
knurled sides provide additional cutting action.

BD — *Rigid hub-type. Glass cloth and Nylon reinforcement. Designed especially for right angle portables and disc sanders.*

BFR — *Semi-flexible hub-type. Cotton fabric and Nylon reinforcement.*

See Your Norton Distributor

for a demonstration of Norton Reinforced Wheels in your shop. Ask him for the big new catalog on Reinforced Wheels. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone book, yellow pages. Export: Norton Behr-Manning Overseas Incorporated, Worcester 6, Massachusetts.



BN The preferred cut-off wheel for non-ferrous and non-metallic jobs. Also excellent for cutting wire rope, slotting rails, tuck pointing etc. Used on swing-frame and stationary type cutting-off machines, large and small portables.



BD A specialist in heavier stock removal, such as welds on fabricated work, smoothing flame-cut edges, cleaning between teeth of gear castings, etc. — also for slotting, notching and cutting-off.



BF Mounted Wheels and Points have the same strong laminated construction as the larger BF wheels. For polishing die cavities, chamfering, Brinell spotting, etc. For hand finishing, use BF sticks.



BFR Excels at the lighter portable jobs, such as rust and scale removal, light weld grinding, scarfing and beveling, blending contours, notching gates and risers.

W-1637



*Making better products...
to make your products better*

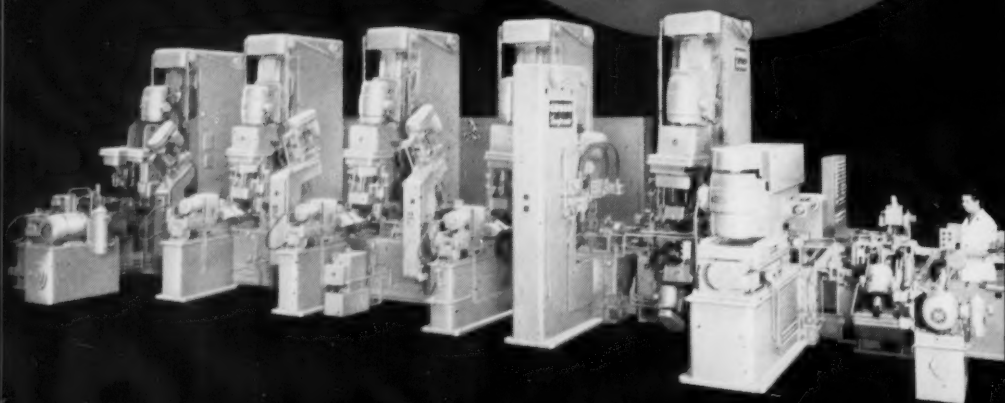
and its BEHR-MANNING division

NORTON COMPANY: Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes

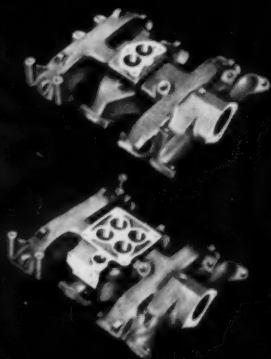
For more data circle 250 on Reader Service Card

Another Transfer-matic by Cross

**Mills, Drills,
Bores, Taps,
2 and 4 Barrel
Intake Manifolds**



- * Rough and finish mills carburetor pad; mills choke pad (4 barrel only); bores carburetor port holes; drills and chamfers all holes (except 3 holes in water outlet pad); and taps all holes.
- * 140 pieces per hour at 100% efficiency.
- * Initial part location from port openings.
- * Push-button changeover from 2 to 4 barrel carburetor.
- * 13 stations; 1 loading, 11 working, 1 unloading.
- * Lift-and-carry type transfer mechanism.
- * Pre-set tooling throughout.
- * Other features: construction to J.I.C. standards; complete interchangeability of all standard and special parts for easy maintenance; hardened and ground ways; drag chain type chip conveyor.



Established 1898

THE CROSS CO.
DETROIT 7, MICHIGAN
Special MACHINE TOOLS

modern machine shop

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Duncan W. Barton, 342 Madison Ave., New York 17, N. Y., Murray Hill 7-7390. Eastern Pennsylvania, Central New York State, New Jersey, Maryland, Delaware, Washington, D. C., Long Island, Brooklyn.

George E. Hay, 431 Main Street, Cincinnati 2, Ohio, MAin 0182. Western Pennsylvania, Western New York, Ohio, Kentucky, Southern Indiana.

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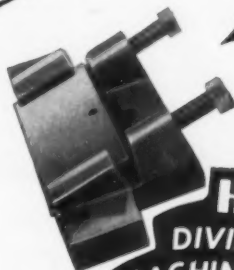
The Robert W. Walker Company, 2330 West Third St., Los Angeles 5, Calif., DUmkirk 7-4388; 57 Post St., San Francisco 4, Calif., SUtter 1-5568. California, Oregon, Washington.

★ ★ ★

modern machine shop
431 Main St. Cincinnati 2, Ohio

June, 1955

Quick Sure Grip
for any work
ON ANY MACHINE TABLE



HART
DIVIDED
MACHINE VISE
JAWS

To hold large or small work securely for any machining—planing, grinding, milling, drilling, etc.

Used singly or in pairs, they are simply bolted or clamped to the machine table. The hardened tool steel jaws are angled to hold down the work, and their edges are serrated to insure a firm grip. The HART Machine Vise is 10 1/4" long, 5" wide, and 2 1/2" high. The jaw itself is 3" by 6". Price \$20.00 each, f.o.b., Cambridge, Mass.

Write for circular

WALTER W. FIELD & SON, INC.
39 Hayward St., Cambridge 42, Mass.

Makers of the famous
HART MILLING FIXTURES
"Masters of a Thousand Set-ups"

For more data circle 252 on Reader Service Card

modern machine shop 53

Carbide grinding's "CROWN JEWELS"

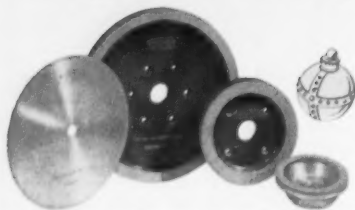
...with a royal reputation for better, lower cost grinding



Norton Vitrified Bonded Diamond Wheels feature fast stock removal, high resistance to grooving and long service life. *Typical Applications:* production grinding of single-point carbide tools; grinding chip breakers; cylindrical, surface and internal precision grinding of carbide tools, cutters, discs, gages, rolls, etc.



Norton Resinoid Bonded Diamond Wheels are made in two bond types — regular, for wet grinding and B6, for dry grinding. Each type gives extra fast cutting action and long wheel life. *Typical Applications:* grinding multi-tooth cutters, cutting-off damaged carbide tools; grinding threads "from the solid" in carbide taps and thread gages.



Norton Metal Bonded Diamond Wheels are engineered for top savings where great durability and resistance to grooving, rather than fast rate of cut, are chief requirements. *Typical Applications:* sharpening single-point carbide tools; reconditioning dull or chipped carbide tools; cutting-off sintered carbide blanks and many other materials.

The Norton line of diamond wheels is complete, covering carbide, ceramics, glass, electronics, stone and every other application requiring this superhard abrasive. See

your Norton Distributor or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities. Export: Norton Behr-Manning Overseas Inc., Worcester 6, Mass.

W-1617



*Making better products...
to make your products better*

and its BEHR-MANNING division

NORTON: Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING: Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes

For more data circle 253 on Reader Service Card

The NEW CLAMPCUT SINE VISE



QUALITY CONTROL CHECK AT FACTORY. READING OF "ONE-TENTH" INDICATOR READS 0 ALONG 6" OF THE PARALLEL. NOTE ADJUSTABLE STOP (See Inset).

SQUARE WITHIN 0.0001"

THE POSITIVE WAY TO HOLD WORK FOR PRECISION GRINDING

**Hardened, Ground and Lapped—Deep Frozen for Stabilization—
Holds Tapered Diameters and Odd-shaped Workpieces**

For inspection, grinding, milling, drilling and tapping, jig boring, layout work . . .

This new J & S "CLAMPCUT" Vise is one of the most practical precision vises ever developed. Its many helpful features explain why:

It is square, for example, with 0.0001" or less in 1" in 4 positions. It is attachable to J & S 5" sine bar with 0.100" recess for small angles.

Accurate, Adjustable Stop

Like all J & S workholding tools, it has a unique downholding clamping action. This assures dependable, accurate positioning of workpieces. An adjustable stop provides fast, sure positions for repeat operations. Workpieces can be loaded and unloaded rapidly.

Holds Tapered, Odd-shaped Workpieces

The clamping jaw of this J & S Precision Grinding

Vise swivels to permit holding of tapered and odd-shaped workpieces. It holds round stock from 1/8" to 2 1/2" in diameter in Vee-block fashion. The range of jaw openings is from 0" to 3".

Get all the facts without delay. Fill in the coupon and mail it today.

J & S TOOL CO., INC. (CLAMPCUT TOOLS)

871 Dorsa Avenue, Livingston, N. J.

Please send me complete information on your J & S Precision Grinding Vise.

NAME

COMPANY

STREET

CITY STATE



WHEEL DRESSERS • JAW CLAMPS • PRECISION VISES • SINE BARS • DOWN-HOLDING DEVICES

871 Dorsa Avenue, Livingston, New Jersey



Now—Lock Your Feed Rates to Protect Machines . . . Reduce Costs with the **CROSS** Flow Control Lock!

Only authorized personnel carry a key for the Cross Flow Control Lock! They set machine feed rate, then lock it.

Easy to install. Just remove valve nameplate and adjusting lever, re-install over lock mounting plate.

Available for Vickers $\frac{1}{4}$ " flow control valves and remote control panels.

For full details, write Dept. A-62.

- Eliminates Tampering
- Stops Costly Shutdowns
- Prevents Tool Abuse and Breakage
- Protects Machines Against Overloads
- Reduces Maintenance Costs

Established 1898

THE **CROSS** CO.
DETROIT 7, MICHIGAN

For more data circle 255 on Reader Service Card

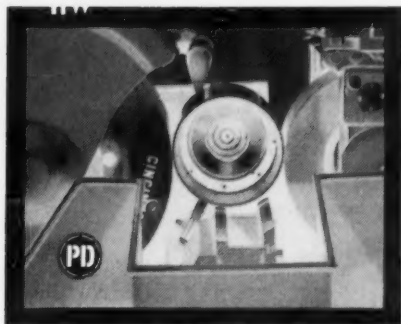
NOW!

Cincinnati Grinding Wheels offer



Positive Duplication

an outstanding development that will save you money and increase production



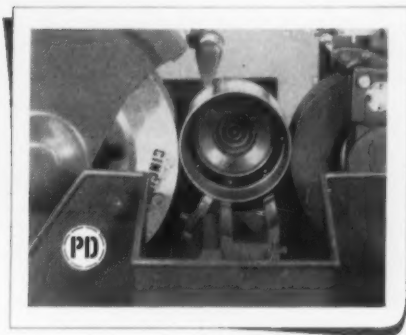
... POSITIVE DUPLICATION of an original grinding wheel each and every time through the CINCINNATI (PD) Manufacturing Process.

Through the CINCINNATI (PD) Manufacturing Process you are assured a Positive Duplication of the original wheel *every* time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS are priced no higher than ordinary wheels.

We'll be glad to prove to you how CINCINNATI (PD) WHEELS can save you money and increase your production. Just

Just as a NEGATIVE guarantees you an exact duplication of a photograph each and every time, you are always assured a...



contact us and we'll send one of our representatives. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.



For more data circle 256 on Reader Service Card



WIEDEMANN in SHORT RUN

WIEDEMANN combines in ONE machine

1. the speed of a punch press
2. turrets carrying 12 to 32 punches and dies
3. a quick-setting, mechanical work positioning gauge

WIEDEMANN Cuts Piercing Costs 60% to 90%

• ELIMINATES SETUP

Necessary punches and dies are carried in turrets... any tool is rotated to piercing position in 3 to 5 seconds.

• ELIMINATES LAYOUT

Material to be punched is rapidly and accurately positioned with a Wiedemann work locating gauge.

• UNLIMITED FLEXIBILITY

Punches and dies of any shape and size can be used within the capacity of the press. A variety of openings can be made with the same punch and die.

Send drawings of your work for both time studies and recommendations on the Wiedemann Turret Punch Press and tools best suited for your needs. Every Wiedemann press is shipped completely toolled, ready to produce when leveled and connected to a power line.



R-44

...clamps, panels, and other flat metal components quickly positioned with a gauge or placed through conventional templates.

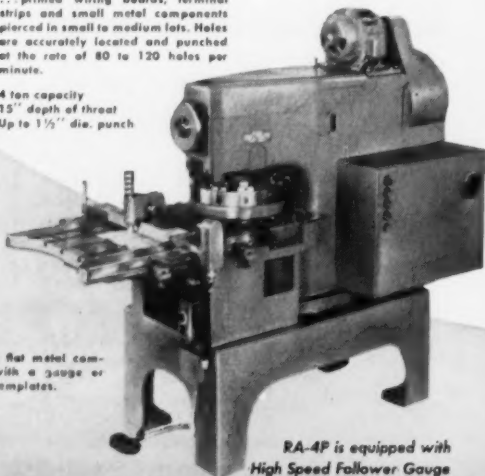
15 ton capacity
28" depth of throat
Up to 3 1/2" dia. punch

R-44 is shown with Rack Type Gauge

RA-4P

...printed wiring boards, terminal strips and small metal components pierced in small to medium lots. Holes are accurately located and punched at the rate of 80 to 120 holes per minute.

4 ton capacity
15" depth of throat
Up to 1 1/2" dia. punch



RA-4P is equipped with High Speed Follower Gauge

W I E D E M A N N

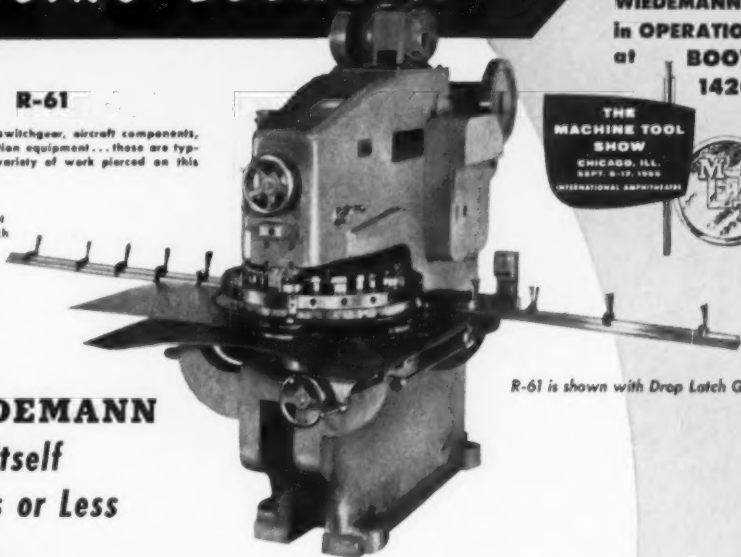
IS THE ULTIMATE PIERCING ECONOMY

SEE 8
WIEDEMANN'S
In OPERATION
at BOOTH
1420

R-61

... radar chassis, switchgear, aircraft components, industrial refrigeration equipment... these are typical of the wide variety of work pierced on this versatile press.

40 ton capacity
33" depth of throat
Up to 6" dia. punch



R-61 is shown with Drop Latch Gauge

A WIEDEMANN
Pays for Itself
in 2 Years or Less

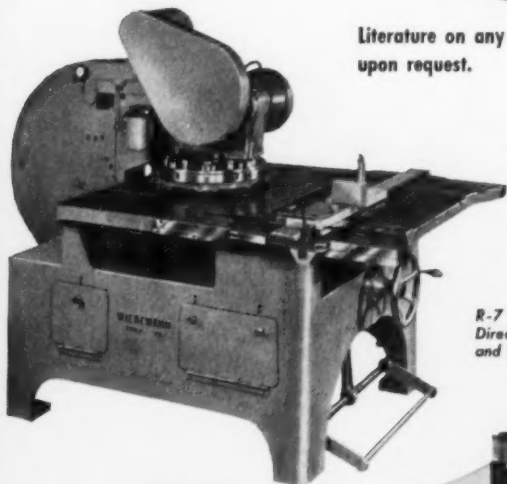
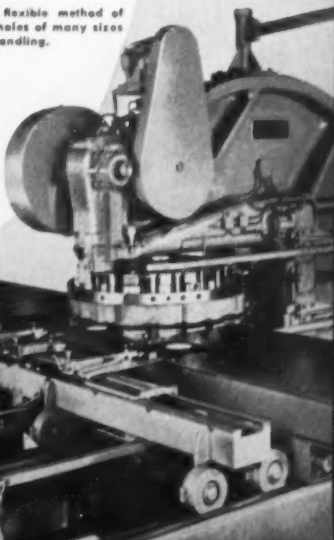
Literature on any of these Wiedemann Presses will be sent upon request.

R-7

... provides the only flexible method of locating and piercing holes of many sizes in large work in one handling.

80 ton capacity
60" depth of throat
Up to 7" dia. punch

R-7 is equipped with
Direct Measuring Gauge
and Table



RA-41P

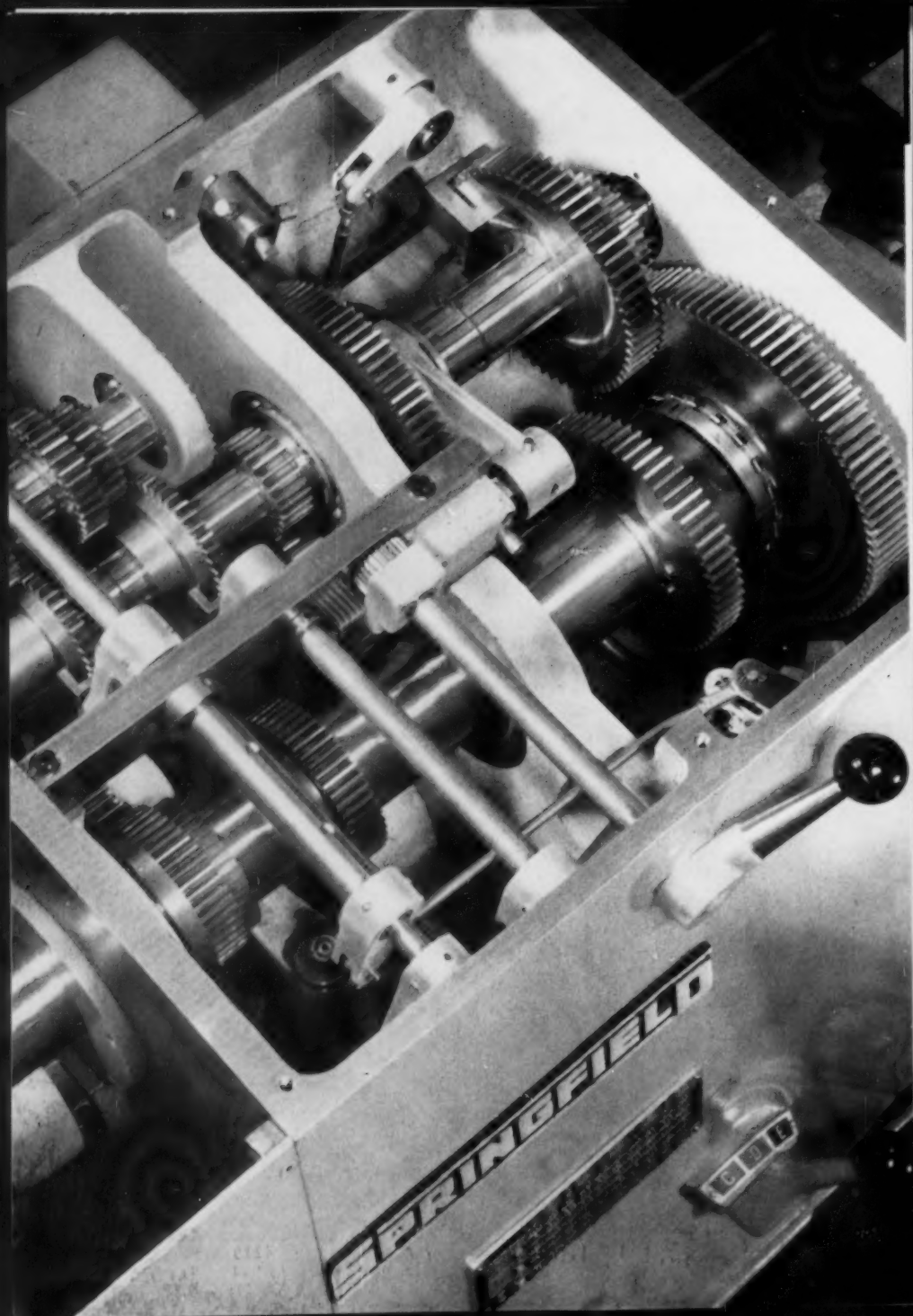
... high speed piercing of electronic chassis, panels, components and similar work.

15 ton capacity
28" depth of throat
Up to 3 1/4" dia. punch

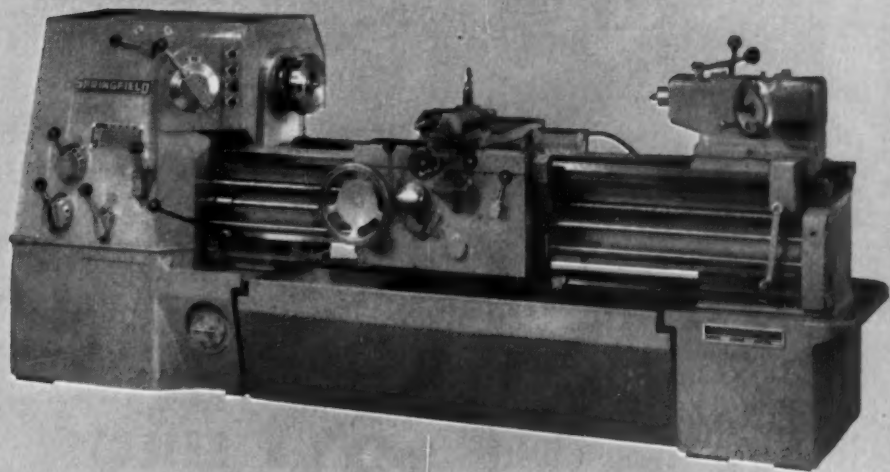
RA-41P is equipped with High Speed Follower Gauge

MACHINE CO.

4219 WISSAHICKON AVENUE
PHILADELPHIA 32, PA.



See Springfield at Booth 612, Machine Tool Show, Chicago, Sept. 6-17.



more useful horsepower

All the horsepower in a Springfield Model "S" Lathe is productive.

A simple, straight-forward gear train, plus double-action lubrication, plus tight dynamic balance tolerances (.0005" displacement) eliminate friction and vibration, the twin horsepower thieves.

In the headstock, only the gears necessary to a given speed are engaged. Other gears run free with a stabilizing flywheel action, no drag on power.

A high pressure filtered oil mist keeps all gears and bearings drenched, and a cascade of oil lubricates the feed box.

Lathes: Engine and tool room, contouring and reproducing—swings 14" to 32".

Vertical Universal Grinders: swings 18" to 42".

The Springfield Machine Tool Company
Springfield, Ohio

65TH YEAR OF BUILDING IDEAS INTO MACHINE TOOLS

SPRINGFIELD



PRODUCTION

UP 53%

**FEWER
REJECTS**

HOWE & FANT TURRET DRILL CASE HISTORY

#25

Part — Aluminum elbow

Fixture — 3 position, lever transfer, air clamp, bolted to machine table.

Operations

I Load. **II** Spot 2 holes 3/8 x 90°. **III** Index turret and drill 2 holes .272" dia. .625" deep. **IV** Index turret and tap 2 holes 5/16—24 class 3 fit .520" deep. **V** Index turret and core drill 1 hole .801" dia. .410" deep. **VI** Unload and clean.

Production rate — 73.2 pieces (\$12.4 machining operations per hour).

Comment

Job is a "natural" for the H&F turret drill. Part is clamped by air in simple fixture lever actuated to provide 3 predetermined working positions. This assures minimum transfer time and proper loca-

tion of part under working tool. Each tool turns at optimum preset speed in this case:

| | |
|--------------------------|-------------|
| Spot drill | 1825 r.p.m. |
| .272" dia. drill | 2375 r.p.m. |
| 5/16—24 tap | 1150 r.p.m. |
| .801" dia. core drill .. | 825 r.p.m. |

Tap automatically reverses at twice forward speed at preset depth. All depths controlled within .002".

Set-up increases production 53% over 4-spindle drill press with box jig. Rejects are virtually eliminated, tool life greatly increased. The H&F installation has won unanimous operator approval by appreciably cutting fatigue while increasing output.

WRITE FOR THE H&F CATALOG
AND FURTHER TIME STUDIES



HOWE & FANT, Inc.

29 FITCH STREET • EAST NORWALK • CONNECTICUT

For more data circle 261 on Reader Service Card



IN THE AUTOMOTIVE
INDUSTRY, IT'S

UNION



**UNION DISTRIBUTORS
SERVE THE NATION**

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CALL YOUR UNION DISTRIBUTOR

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Benefit Now

from the

**UNBELIEVABLY NEW,
WIDER RANGE of
FINISHING ADAPTABILITY
and TIME-SAVINGS of
Brightboy
Rubber-Cushioned
Abrasives**

Brightboy's unique formulation of *abrasive and rubber*, working together, gives you a completely new, wider

concept of time-saving operations you never before associated with abrasives.

Alert production men now explore Brightboy applications as regular routine to find cost-cutting procedures on new job projects and on current work.

Stock Brightboy Abrasives, particularly matched to your job, are available in a wide range of sizes and grades. Brightboy is compounded with either Aluminum Oxide or Silicon Carbide, in grain sizes ranging from extra fine to extra coarse, impregnated throughout soft, firm or tough rubber binders of uniformly dependable texture.

This New Brightboy Catalog Tells You:

1. WHAT BRIGHTBOY IS
2. WHAT BRIGHTBOY DOES
3. THE GRAINS AND TEXTURES FOR YOUR JOB
4. THE MACHINE SPEEDS BEST SUITED

ASK YOUR DEALER FOR IT! Write us if he cannot supply you. Send us your specifications on jobs on which you have finishing and polishing problems or on which you would like to cut your time costs.



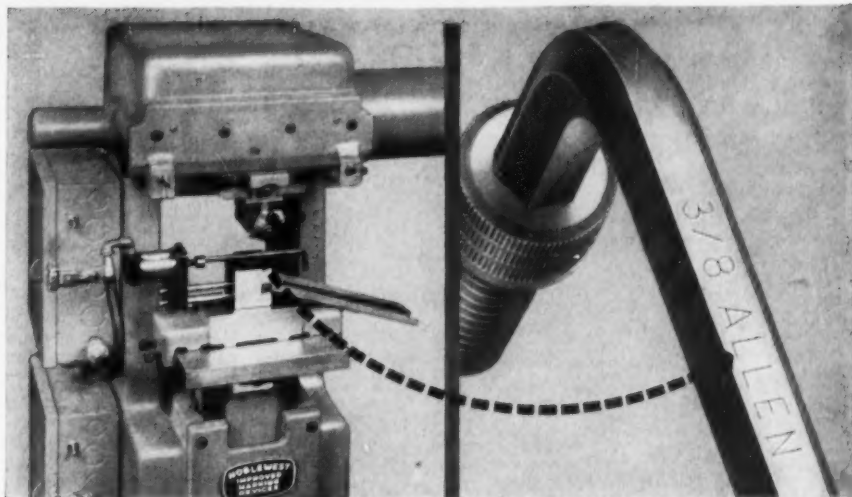
**BRIGHTBOY INDUSTRIAL DIVISION
WELDON ROBERTS RUBBER CO.**

95 North 13th Street • Newark 7, N. J.

America's Pioneer Manufacturer of Rubber-Bonded Abrasives

For more data circle 253 on Reader Service Card





Roll Marks manufacturer's identification permanently.

HIGH PRODUCTION MARKING WITH NEW *Cyclomatic* CONTROL

This general purpose marking machine combines the original NOBLEWEST Roll Marking process with CYCLOMATIC CONTROL . . . an exclusive NOBLEWEST electro-pneumatic circuit for completely automatic cycling. When set for automatic operation the machine cycles continuously with no further attention required from the operator. A dual control system also provides for semi-automatic operation or for short production runs. This model can also be equipped with an air ejection system (see above) plus an automatic hopper or dial feed. The basic Model 50P1 features a low price, plus quick delivery! For additional details on how NOBLEWEST Marking Machine, tools and dies can lower your production costs, write the Noble & Westbrook Manufacturing Company, 25 Westbrook Street, East Hartford 8, Conn.



MARK IT BEST WITH

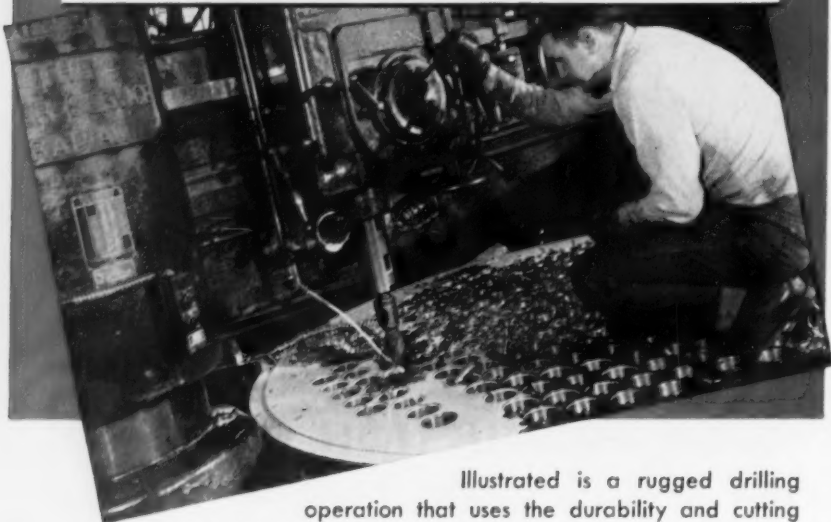
NOBLEWEST

ORIGINATORS OF THE ROLL MARKING PROCESS

EQUIPMENT FOR MARKING • GRADUATING • EMBOSSING • NUMBERING

For more data circle 264 on Reader Service Card

Here's **DRILLING** At Its **BEST** In Stainless Steel Tube Sheet



Illustrated is a rugged drilling operation that uses the durability and cutting speed of standard Whitman & Barnes High Speed Drills. This 446 stainless steel tube sheet for a special heat exchanger in a chemical plant requires 602 holes $2\frac{1}{16}$ " in diameter be drilled through the $2\frac{1}{2}$ " depth of the sheet. W & B drills are operated without regrinding for approximately four hours at 69 R.P.M. and with .012" feed. For the best in drilling performance on your every operation—specify W & B.

"Makers of Fine Tools Since 1848"

DRILLS, REAMERS, COUNTERBORES, COUNTER-
SINKS, TOOL BITS, CARBIDE TOOLS, SPECIAL TOOLS

W&B

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40050 PLYMOUTH ROAD • PLYMOUTH, MICHIGAN
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Call
your W&B distributor
for best service
and highest quality

He can save you money
by supplying from his
stock . . . what you need
when you need it!

For more data circle 265 on Reader Service Card

Talking About Die Sets



WITH
PHIL MARSILIUS
Vice-President
The Producto Machine Co.

Steel vs. Semi-Steel—What should your choice be when selecting a catalog die set? Quite often, the answer is a matter of dollars and cents. Naturally, you'd like to tool-up as inexpensively as possible but you must also be sure that an initial savings will not result in excessive replacement costs later on. In making a choice, the complete cost of tooling-up and maintenance during operation should be considered along the following lines:

- Initial cost of either type;
- Cost of machining either type;
- Unit cost of die set per part produced;
- Replacement cost in event of damage.

Taking each point individually, if two dies are identically made, except that one is mounted in a semi-steel die set and the other in a steel set:

The semi-steel set will cost less, machine easier, and have a lower cost per unit produced, if not replaced due to damage.



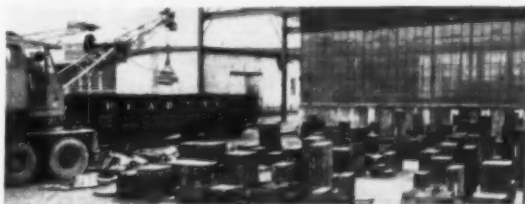
The steel set will cost more and require more machining time but may reduce the probability of breakage if excessive machining is performed on the die bed, and thus reduce the unit cost per part produced.

In general, for the average stamping operation, with all points considered, a semi-steel set is probably more economical. For heavy stamping operations, or for those that will run for a long time, a steel set would be the more practical. Either type can be purchased in the two grades of accuracy—Master-Precision and Commercial.

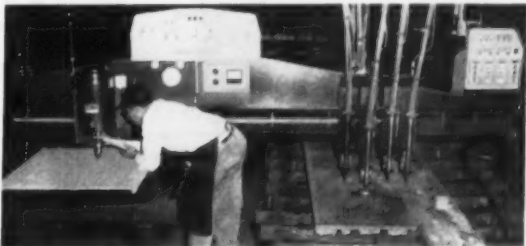
Where the advantages of a steel die set are desired and the savings of a semi-steel set are important, a combination of semi-steel punch holder and steel die holder offers an obvious, though seldom considered, solution.

Special Die Sets—When special die sets will have irregular contours, steps, bosses and other built-up sections or machined pockets, a set with these components integrally cast offers extensive savings in machining or fabricating costs.

WHERE BETTER STEEL DIE SETS START



Catalog Sets Begin as mill-cut steel punch holders and die beds, shown above in a partial view of the Producto stockpile. These steel blanks are readily available to replace inventories of completely machined components, permit immediate completion of large orders for any one size. Pre-cutting of catalog components leaves flame-cutting equipment free at all times for work on specials.



Special Sets Begin their journey through the Producto plant at modern flame-cutting machines like the one shown above. Always open for specials only, this machine cuts any shape of plate up to 8" thick. Operator is tracing template, contours of which are reproducing a 3" thick punch holder for a special set. Latest-type equipment manned by skilled operator gives greater accuracy of dimensions for length and width of sets and cut-out or drop-out holes, by permitting straighter, cleaner flame-cut edges.

From stockpile to shipping room, Producto's unmatched modern facilities are keyed to meet your every die set need quickly. For precision die sets fast, call your nearest Producto branch.

THE PRODUCTO MACHINE COMPANY
910 Housatonic Avenue, Bridgeport 1, Connecticut
FOrest 7-8675

For prompt die set service, phone these PRODUCTO assembly warehouses:

| | | | | | |
|-----------|-----------|-------------|-----------|--------------|-----------|
| Atlanta | CY 7667 | Detroit | LI 6-7600 | New York | WO 4-7484 |
| Chicago | ES 8-3307 | Kansas City | VI 1162 | Philadelphia | MO 4-1010 |
| Cleveland | SU 1-6158 | Los Angeles | TR 9826 | Rochester | GL 1810 |
| Dayton | MU 1651 | | | | |

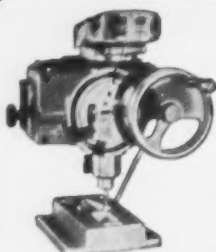
any stamping center in the United States or Canada for distributors stocking PRODUCTO.

Produce More With



Die Sets

For more data circle 266 on Reader Service Card

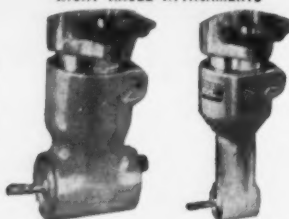


CHERRYING ATTACHMENT

Makes possible production of convex and concave shapes. Ideal for producing drop forge dies, molds, cavities, metal core boxes, etc.

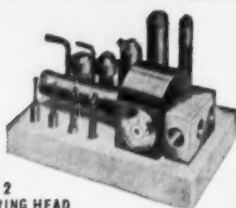
A few of the Attachments available

RIGHT ANGLE ATTACHMENTS



(Left) Heavy Duty . . . for milling and drilling at right angles; fits both Master and 1 HP Bridgeport Heads. (Right) Light Duty . . . for right angle milling and drilling narrow, deep molds and cavities.

Improved and providing great gripping power, with large diameter screw for rigid holding. Streamlined for appearance and equipped with coolant trough. Two sizes.



No. 2 BORING HEAD

Boring Tools and Holder provide means for boring holes up to 6" diameter; available for use on Bridgeport 1 HP Milling, Drilling and Boring Attachment.



MILLING MACHINE
← VISE



Bridgeport

offers great versatility
through its wide range of
ATTACHMENTS

"Bridgeport Millers" in themselves, are universally recognized as machines of outstanding utility. Their exclusive method of being able to drill, mill, bore and shape over a wide area without changing set-up, has contributed much to their universal acceptance through the convenience, economy and accuracy offered. But this is not the whole story . . .

Note the attachments shown above. Here are a few means developed by "Bridgeport" engineers to go still further in extending the versatility of these machines . . . attachments which mean not only greater convenience but which vastly extend the operations which can be performed . . . attachments which will enable one machine to do the work of several single purpose machines. Furthermore, many more jobs can be assigned to the "Bridgeport" with the result that many more productive hours are available from one machine.

Ask your dealer . . . or us . . . to show how you, too, can apply Bridgeport Attachments to extend the utility of your machines. Ask also for literature on Bridgeport Turret Milling Machines.

Bridgeport MACHINES, INC.

Bridgeport, Connecticut

Manufacturers of High Speed Milling Attachments and Turret Milling Machines

For more data circle 267 on Reader Service Card

NEW

ADJUSTABLE

I. D. GROOVE GAGE

These **3** gages measure
groove diameters



from .495" to 6.00"

FEDERAL Model 99P Series Indicator Gages measure inside diameters of retaining grooves with an accuracy not found in similar gages — also other internal dimensions including shallow recesses, and similar conditions.

Each gage has an exceptionally wide gaging capacity: the set of three measures from .495" to 6.00" inclusive. Diameters smaller than .495" can be checked, depending how far within the hole the groove is located.

Weight of gage or operator's hand does not affect the accuracy. These gages are simple — easily and precisely handled — and avoid the limitations and awkwardness found in other types.

Ask for descriptive bulletin.

FEDERAL PRODUCTS CORPORATION
5146 Eddy Street, Providence 1, R. I.

Ask **FEDERAL**

FOR ANYTHING IN MODERN GAGES...

Dial Indicating, Air, Electric, or electronic — for inspecting, measuring, sorting,
or automatically controlling dimensions on machines.

For more data circle 258 on Reader Service Card



On the back of each color TV viewing screen are more than one million phosphor dots (19" screen) grouped in uniform patterns of red, green and blue. Electron beams registered with each dot are shot at these phosphors—the intensity determining the dominating color.

Directly behind the screen in each tube is a Cupro Nickel shadow mask. Each hole is registered exactly with its group of phosphor dots on the screen and with the electron beam—the mask controls the register of color—keeps the image sharp—the color true.

Color TV came to ANACONDA

When the television industry needed a shadow mask to control electron beams in the color tube, Buckbee Mears Company, photoengravers of

Cupro Nickel came to ANACONDA

When the television industry needed a shadow mask to control electron beams in the color tube, Buckbee Mears Company, photoengravers of St. Paul, Minnesota, produced it. When they needed thin strip metal in which 2500 perfect holes per square inch could be etched, Anaconda produced it.

When color TV came to Anaconda, we developed a new alloy, 6% Cupro Nickel, with such uniform quality, structure and thickness (0.0075") that the microscopic holes could be etched without flaw. The new alloy also has the strength and malleability to take forming without distortion of the dot structure, and functions in a color tube without contaminating the vacuum.

Again, a copper alloy has solved a difficult problem. Perhaps yours can be made easier through Anaconda research and development. The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Limited, New Toronto, Ontario.

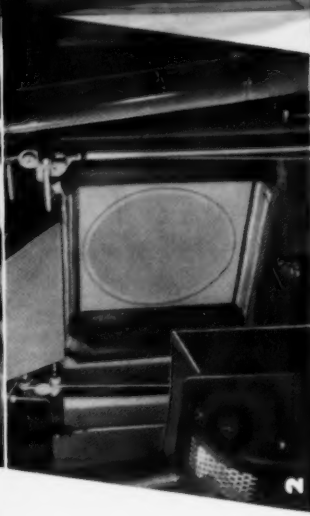
1 Rolls of the Cupro Nickel strip entering coating machine to be sensitized for photographic printing.

2 Camera printing dot pattern on the sensitized Cupro Nickel strip.

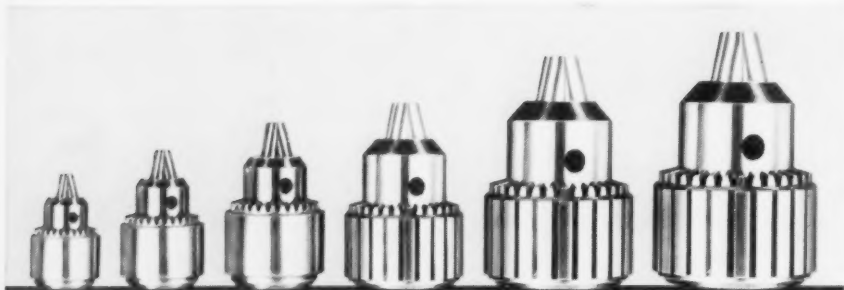
3 Printed Cupro Nickel strip at right entering etching machine where acid baths plus washing and rinsing operations produce finished mask.

4 Each 19" shadow mask has more than 400,000 holes, size .010 \pm .0005. Several areas of screen are inspected electronically to check hole size.

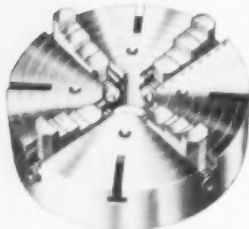
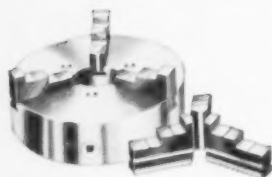
ANACONDA the name to remember in
COPPER • BRASS • BRONZE



SPECIFY *Almond...*



YOUR COMPLETE LINE OF PRECISION CHUCKS



MEDIUM DUTY LATHE CHUCKS
Bodies made from semi-steel castings with 1% nickel giving close grain with extreme strength.

Precision workmanship is the standard through every phase of manufacture of all Almond Chucks —precision that pays off for you in accuracy, long life, and lower costs!

And Almond offers you a line of drill chucks in a complete range of sizes from 0 to 1-inch capacities—a total of 30 individual models of taper arbor hole chucks, and 28 threaded arbor hole chucks to meet your requirements. Almond precision medium duty lathe chucks, from 3 through 15-inch universal geared scroll lathe chucks and 4 through 16-inch independent lathe chucks, also give the industrial and O. E. M. user a wide choice of chucks for dependable, high precision production. See your industrial distributor—specify Almond Chucks!



T. R. ALMOND MFG. COMPANY

4610 BEIDLER ROAD
WILLOUGHBY, OHIO

For more data circle 271 on Reader Service Card

Now you can buy
a press brake like this
"off the shelf" for \$1455



**Verson now offers standard brakes
with immediate delivery from stock**

Any shop where metal is bent can now take advantage of a new convenient way of buying quality all steel press brakes. There's no need for involved proposals or a long wait for delivery. You can now buy Verson No. 16-48 and No. 1062 brakes as easily as buying a car. Prices are published publicly and delivery of standard models is made from *stock*.

Write for spec sheets on either model and then place your order.

A Verson Press for every job from 60 tons up.



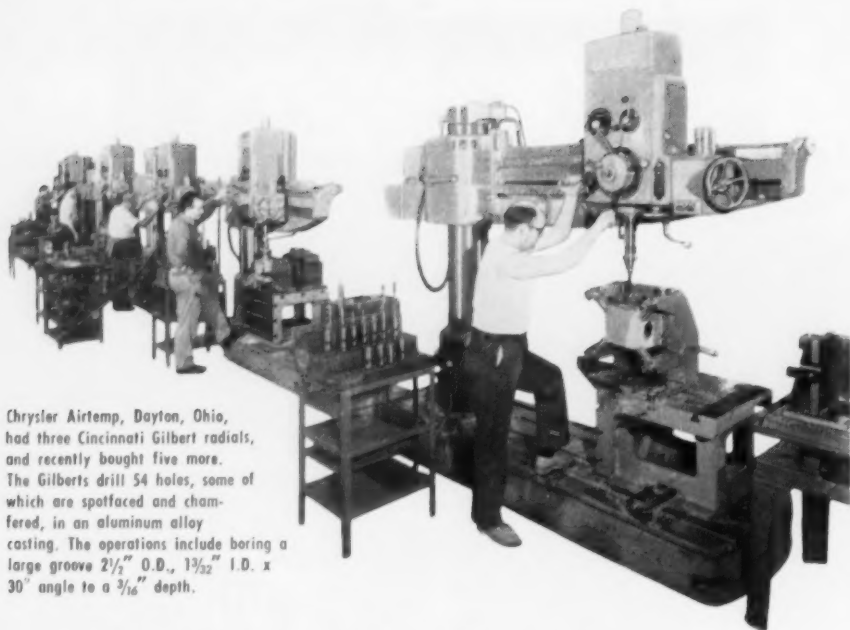
ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

VERSON ALLSTEEL PRESS CO.

9310 S. Kenwood Avenue, Chicago 19, Illinois
So. Lamar at Ledbetter Drive, Dallas, Texas

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES
TOOLING • DIE CUSHIONS • Verson-WHEELON HYDRAULIC PRESSES

For more data circle 272 on Reader Service Card



Chrysler Airtemp, Dayton, Ohio, had three Cincinnati Gilbert radials, and recently bought five more. The Gilberts drill 54 holes, some of which are spotfaced and chamfered, in an aluminum alloy casting. The operations include boring a large groove $2\frac{1}{2}$ " O.D., $1\frac{1}{2}$ " I.D. x 30° angle to a $\frac{3}{16}$ " depth.

They bought five more...

because Gilberts produce more. Ease of operation explains in part why Gilbert radials produce more in so many plants. For example, all speed and feed controls are on the head, within easy reach of the operator even when the arm is in its highest position. Direct reading speed and feed plates eliminate time-consuming calculations. You get instant finger-tip shifting of speed and feed levers. The four-lever feed turnstile puts one lever always within handy reach. Other easy-operating features: finger-tip clamping of the head to the arm; instantaneous one-lever arm con-

trol (unclamps, raises, or lowers the arm in one easy motion); effortless head traversing due to balanced, ball-bearing mounting; adjustable electric light at the spindle.

Gilbert radials have 9 or 11-inch columns; 12 spindle speeds in each of 3 ranges; 6 power feeds, .003" to .020". Tap leads are available. *Delivery in 30 days or less.* As the Chrysler Airtemp story shows, "those who buy Gilbert buy Gilbert again." Get full data on the Gilbert's many advantages.

Write for Bulletin 349 today. ▼

GILBERT

RADIALS • BORING MILLS • ACCESSORIES

THE CINCINNATI GILBERT MACHINE TOOL CO., 3366 BEEKMAN ST. • CINCINNATI 23, OHIO

For more data circle 273 on Reader Service Card

70 modern machine shop



June, 1955



**THE MOTCH & MERRYWEATHER CUTTING TOOL
MANUFACTURING DIVISION**

offers you . . .
cutting tool aids to production

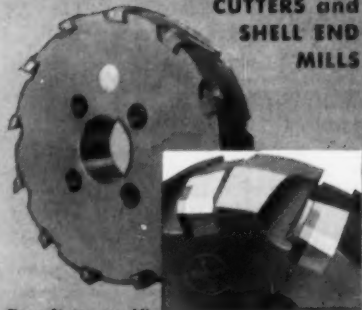
**ASK YOUR DEALER
ABOUT EVERY
ONE OF THEM**

SEGMENTAL TYPE • SOLID TYPE • SLITTING SAWS

• Get the full story on Motch & Merryweather's complete line of saw blades and slitting-slotting saws — a type, size, and thickness for every purpose. Triple-Chip cut-off blades up to 108" diameter down to slitting saws 3" in diameter — special

saws — for any machinable material, ferrous or non-ferrous, any size, any shape, any thickness. Ask how the M & M Triple-Chip Method reduces tooth strains, prolongs blade life and speeds production with accuracy.

**KROSLOK® FACE MILLING
CUTTERS and
SHELL END
MILLS**



Simplicity itself!

Only 3 members—body, blade, wedge. Blade and body are serrated in two directions to prevent blade shifting. Cuts any machinable metal. A profit-showing investment in precision production milling.

TRIPLE C® GRINDING COOLANT

Clear — Cool — Clean

Triple C® grinding coolant makes for improved results and lower costs on all wet grinding. Transparent, stable solutions; maximum cooling; grinding wheels stay clean and free-cutting.

**TRIPLE-CHIP HEAVY DUTY
ANTI-WELD SOLUBLE OIL**

M & M Heavy Duty Anti-Weld Soluble Oil lengthens tool life, especially under severe conditions. Deters "pickup", cuts rejects, is oily (not greasy), odorless; lowers production costs.

**THE
MOTCH & MERRYWEATHER
MACHINERY CO.**

Cutting Tool Manufacturing Division

1250 EAST 222nd STREET, CLEVELAND 17, OHIO

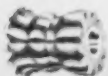
For more data circle 274 on Reader Service Card



GROUND
MULTIPLE
THREAD
MILLING
CUTTERS



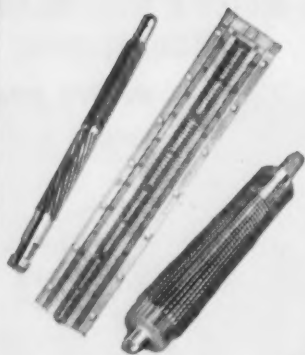
FORM RELIEVED
MILLING CUTTERS



SINGLE POINT
TOOLS



FORM TOOLS



BROACHES



CONTINENTAL DRIVE TOOLS



FACE MILLS



Why These Cutting Tools are *Production Proved*

Continental is an Ex-Cell-O subsidiary.

As such, we are constantly trying out new tool designs, new methods, in Ex-Cell-O's big parts production shops.

There could be no finer "proving ground" for testing new materials and new methods. There are no finer cutting tools than "Production-Proved" tools by Continental.

Call in your Ex-Cell-O representative or contact Continental in Detroit for information about them.



55-31

Continental

TOOL WORKS

Division of Ex-Cell-O Corporation, Detroit 32, Mich.

For more data circle 275 on Reader Service Card

ENGRAVE

PLUG AND RING GAGES

in your own shop



*Lowest set-up time
for unskilled labor*



GAGES by BROWNE & LAIL, Santa Monica

Many leading manufacturers have found the NEW HERMES the most versatile portable engraver for rapid marking of tools—nameplates—panels—dials.

- Adjustable for 15 ratios.
- Self-centering holding vise.
- Automatic depth regulator.
- Adjustable copy holders.

Send for Catalog No. IM-27.

NEW HERMES ENGRAVING MACHINE CORP.

13-19 University Pl., New York 3, N. Y.

For more data circle 276 on Reader Service Card

Tough grinding jobs?

Check ***Vulcanaire***
high speed precision
grinding heads!

Many seemingly impossible grinding problems have been solved by adapting Vulcanaire to standard machines or by using one of Vulcan's specially designed machines.

On Surface Grinders, merely remove wheel and guard, clamp vertical or horizontal adaptor to machine as illustrated. No belts necessary. For instance, Vulcanaire used in connection with Vulcan's Rotary Table for Surface Grinders permits the grinding of a circular slot.

Adaptors are in stock to fit the spindle of Vertical Milling Machines for grinding contours, holes and slots.

On Internal Grinding Machines Vulcanaire's infinitely controlled speeds furnish the correct surface cutting speed resulting in faster production and micro finish. The adaptor sleeve fits into present housing.

Applied to Jig Boring Machines, Vulcanaire is liked by leading precision manufacturers because its accuracy is guaranteed, producing Vulcanaire jig grinding of large and small parts.

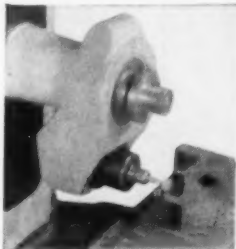
Send us a blue print on your toughest grinding problem. Recommendations and sketches will be returned to you — no obligation.



Grinding circular slot using Vulcan's Rotary Table and Magnetic chuck.



Vertical adaptor for Surface Grinders. Grinding small slots



Horizontal application Grinding a Shoulder Punch.

Major Vulcan Services

Engineering, Processing, Designing and Building . . . Special Tools . . . Dies . . . Special Machines . . . Vulcamatic Transfer Machines . . . Automation . . . including the Vulcan Hydraulics that Form, Pierce, Assemble and size. Vulcanaire Jig Grinders . . . Motorized Rotary Tables . . . Plastic Tooling.

VULCAN TOOL CO.

710 LORAIN, DAYTON, OHIO

FLEXLOC AT WORK



MORE AND MORE FLEXLOC LOCKNUTS are being used on applications where dependable locking is essential to the operation of the equipment and the safety of the operator. This bundling chain with automatic lock provides positive grip and safe, sure bundle handling.

Two FLEXLOC Self-Locking Nuts hold this assembly together. Once the locking threads are fully engaged, the nuts won't work loose, regardless of the conditions under which they are used.

FLEXLOC one-piece, all-metal nuts are available in a full range of sizes in any quantity. Standard FLEXLOCs are stocked by leading industrial distributors everywhere. Write for Bulletin 866 and samples. STANDARD PRESSED STEEL CO., Jenkintown 22, Pa.

**FLEXLOC****LOCKNUT DIVISION****SPS**

JENKINTOWN

PENNSYLVANIA

For more data circle 278 on Reader Service Card

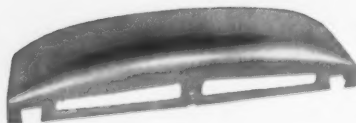
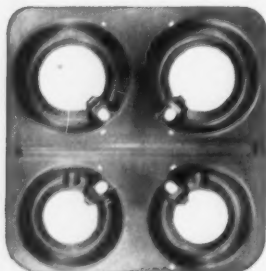
June, 1955

modern machine shop 75



Plastic Low Cost Tooling

For Dies... Drill, Welding, and Assembly Jigs



Vulcan, keeping pace with modern tooling, can recommend plastic tooling for medium production on numerous tool programs.

Plastic tools are light in weight, have good impact, compressive strength and dimensional stability. No hand finishing of parts required as galling or marking is eliminated by using plastic form dies.

Contours and odd shapes are cast or laminated to suit individual tools, saving expensive machine and hand finishing operations.

Plastic tools, built in a matter of days instead of weeks, lower your tool costs for those medium production runs.

Our actual production figures prove plastic has a definite place in modern production.

Vulcan Tool Company's organization, building fine tools since 1916, believes new tooling developments must be proved by tool engineers. Since plastic is not a cure-all your problem should be handled by recognized, practical tool men.

Our engineering staff will recommend the correct plastic material and advise if parts of your tooling program should be in plastic.

Send a part print and your production requirements for quotation and recommendations.

Major Vulcan Services . . . Engineering, Processing, Designing and Building . . . Special Tools . . . Dies . . . Special Machines . . . Vulcamatic Transfer Machines . . . Automation . . . including the Vulcan Hydraulics that Form, Pierce, Assemble and size. Vulcanaire Jig Grinders . . . Motorized Rotary Tables . . . Plastic Tooling.

VULCAN TOOL CO....PLASTIC TOOL DIVISION

727 LORAIN

DAYTON, OHIO

For more data circle 279 on Reader Service Card

76 modern machine shop

June, 1955

no fuss...no muss

WHEN YOU BEND WITH A PEDRICK

Pipe, tube and structural bending with Pedrick Production Benders is the smoothest, simplest, cleanest operation you can imagine. Even usually difficult bends are a cinch, and the costs—*really low!*

Write us your bending problem—we think we can supply a cost-cutting answer. PEDRICK TOOL & MACHINE CO., 3640 N. Lawrence St., Philadelphia 40, Pa. Dept. 5

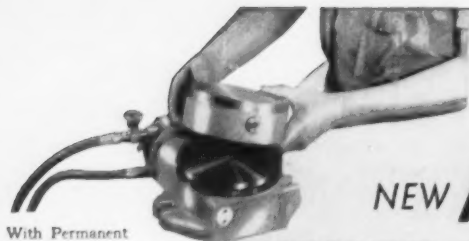


FREE "PEDRICK LINE"
BULLETIN. WRITE TODAY.

PEDRICK

production benders

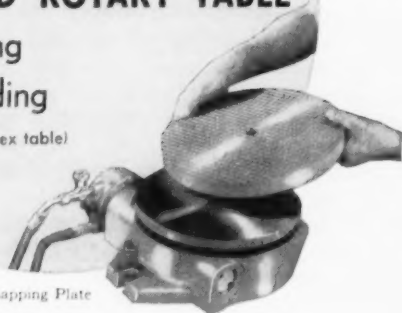
For more data circle 280 on Reader Service Card



With Permanent
Magnetic Chuck

NEW *Vulcan* MOTORIZED ROTARY TABLE for lapping and grinding

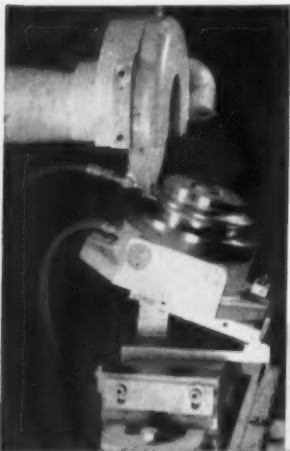
(not an index table)



With Lapping Plate

FASTER circular precision grinding!

Now with this table and with less effort you assure highest standards of accuracy, flatness, finish and close tolerances. At the same time you eliminate slow and complicated tool setups. You cut grinding time greatly by using only cross feed while the table is rotating at infinite speeds between 40 and 100 RPM.



Work clamped to motorized
table, mounted on sine plate.
Surface grinder application.

For example, Vulcan's Rotary Table can be used in connection with a sine plate or angle fixture. The dressing of large expensive external wheels for side grinding is therefore eliminated. If you wish we can provide permanent magnetic chucks designed for use with our table, both 6" and 10" in diameter.

Vulcan's Rotary Table is an air operated, self contained unit, portable between bench or machine. A precision center hole for locating and tapped holes in the table for clamping provides easy setup. Circular surface grinder applications are many and varied — grind flanged studs or bushings — bearing spacers — forming rolls — cutters — convex or concave surfaces — punches or dies (radius or angle).

Lapping? Yes — and in micro inches. For the 6" and 10" table, lapping plates of 12" and 16" are provided. Perfect for lapping valve plates, gages, bearing spacers and for carbide lapping using diamond powder. Write for circular.

Major Vulcan Services

Engineering, Processing, Designing and Building . . . Special Tools . . . Dies . . . Special Machines . . . Vulcamatic Transfer Machines . . . Automation . . . including the Vulcan Hydraulics that Form, Pierce, Assemble and size. Vulcanaire Jig Grinders . . . Motorized Rotary Tables . . . Plastic Tooling.

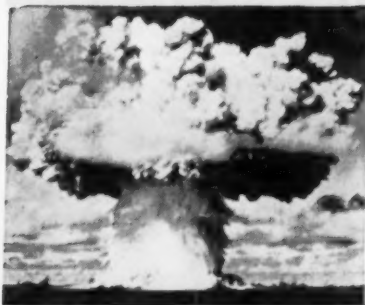
VULCAN TOOL CO.

720 LORAIN

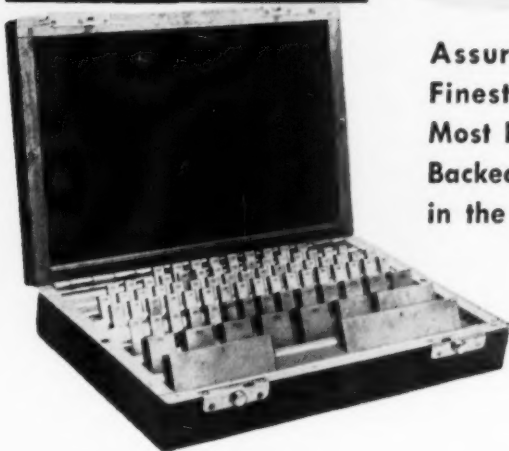
DAYTON, OHIO

For more data circle 281 on Reader Service Card

Checked for accuracy by **ATOMIC LIGHT**



JOHANSSON GAGING EQUIPMENT



**Assures You Precision to the
Finest Degree, to Meet Your
Most Exacting Requirements—
Backed by the Name Supreme
in the World of Measurement.**

Swedish Johansson Gage Blocks are checked for accuracy by the latest scientific method, the atomic light, utilizing the lightwaves emitted from the Mercury isotope 198, now in use at the standard Bureaus throughout the world.

GAGE BLOCKS

(JOHANSSON) and accessories. Short deliveries. Inspection and reconditioning service available at our plant.

INTERNAL INDICATORS

(for inside measurements .155 to 24 inches). Scale range plus or minus .001 graduated to .0001 and minus .020 graduated to .0001.

MIKROKATOR

(Amplifier — for outside measurements) Graduations .0001 to .000002 or .001 M to .0002 M.

OTHER JOHANSSON PRODUCTS

Micrometers, Snap Gages, Extensometers, Dynamometers, Hardness Testers, Surface Finish Indicators, Interferometers, Plugs, Rings and Special Gages.

Write for Literature

C. E. JOHANSSON GAGE CO.

A DIVISION OF SWEDISH GAGE CO.
10641 HAGGERTY AVE. • BOX 4086 NORTHEASTERN STATION • DEARBORN 1, MICH.

For more data circle 282 on Reader Service Card

June, 1955

modern machine shop 79

Mill circles and angles in



Angular adjustment of cutter in the vertical plane is an exclusive feature of the TRI-D Milling Head. Here, operator finish mills intricate workpiece requiring straight, circular, angular and radii milling . . . all accom-

plished in a single set-up.

This job and many others are featured in a 20-minute sound color film, "The Little Show-off." Write on your company or school stationery for reservation.

Builders of Precision and Production Machine Tools Since 1898

one set-up with

For tool rooms, die shops or production milling—do it faster, easier with new TRI-D Head

Kearney & Trecker's new TRI-D Milling Head—featuring rotary movement, lateral and angular adjustment in vertical plane—measurably cuts production milling costs . . . eliminates multiple set-ups . . . produces more in less time. The TRI-D is ideally suited for rough and finish milling of various geometric shapes—straight lines, radii, circles, angles—all in a single set-up. It's adaptable for easy mounting on almost all horizontal and some vertical milling machines . . . *regardless of make.*

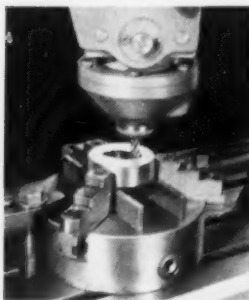
Learn what TRI-D can do for you. Contact your Kearney & Trecker representative for a "proof-positive" demonstration, or write Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wis.



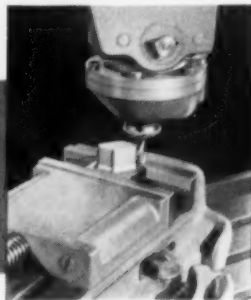
Pat. No. 2286821
Other Pat. Pend.



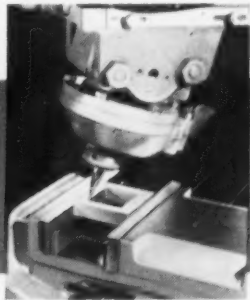
Kearney & Trecker will display and operate more than 25 standard and production machines, including attachments and accessories. Be sure to visit Booth No. 508.



Die (left) and punch are rough and finish milled in single set-up, using three basic movements of TRI-D and milling machine. Table is swiveled for milling straight side of workpieces. Table feed used to mill



long straight side. TRI-D is rotated. Saddle feed is engaged to mill short side. At tangent of next radii, saddle feed disengaged and procedure repeated. Clearance angle in die is milled using same dimensions.



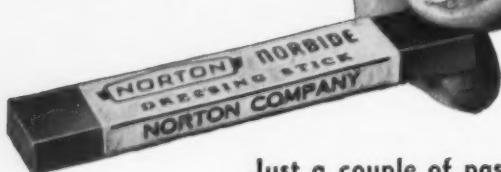
TRI-D with end-mill ground to specific angle is used to square corners. Adjustment of TRI-D and swivel block to prescribed setting and vertical feed of machine is all that's required to do the job.



For more information on TRI-D Milling Head, write for catalog No. TD-10.

For more data circle 284 on Reader Service Card

Have You Tried a NORBIDE® Dressing Stick?



Just a couple of passes
with a NORBIDE Dressing
Stick . . . that's all it takes to . . .

Clean up a wheel face



A NORBIDE Dressing Stick of
Boron Carbide — the hardest
man-made material — will out-
last hundreds of ordinary dress-
ing sticks.

With this light, handy stick
you can see more of the wheel
and thus avoid costly over-
dressing. You'll find it will
greatly reduce dressing dust
nuisance also.

Order a supply of these cost-
cutting sticks from your local
Norton distributor, or write for
Form 1567 giving more details.

Form a radius or groove



Touch up a cup or saucer



NORTON COMPANY, 49 New Bond Street, Worcester 6, Mass.

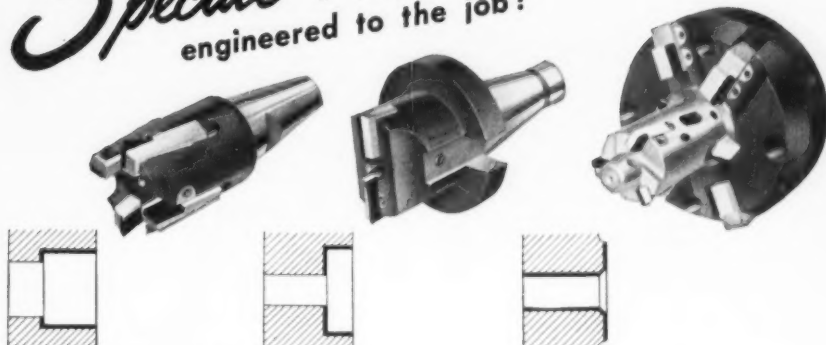


*Next to the diamond in hardness —
available at a fraction of diamond cost*

For more data circle 285 on Reader Service Card

Special Production Tools

engineered to the job!



Combine Related Boring, Counter-Boring, Facing,
and Chamfering Operations Into Just One Tool

**PRODUCE BETTER WORK
FASTER and at LOWER COST**

• How can you keep competitive if you do four operations,
when your competitor does only one?

Cut your costs and increase your output with McCrosky's "Multiple Operation" specials. Engineered specially to your individual work conditions, a McCrosky Special combines 3, 4, 5 or more related operations — does them all simultaneously with one tool — and one set-up — assuring unvarying uniformity of finished product — eliminating repeated handling — reducing the amount of work in process — speeding up deliveries and producing other economies so great that they pay their way even on moderately short runs.

Write for Bulletin No. S-18. It can really save you money!



McCrosky

**TOOL
CORPORATION**
MEADVILLE, PA.

Engineering and Sales Representatives in the Principal Cities

these
thread rolling
pictures*

production

~~would look good
in any shop!~~
now look
even better!

Report from Plant #1

"This shop has been rolling
 $\frac{3}{8}$ "-16 threads continuously
for two months - at
2000 rpm. Still on
first set of rolls -
350,000 pieces to date."

Report from Plant #2

"Have three machines rolling -
 $\frac{1}{2}$ "-20 threads on C-114 steel studs -
close to a million so far - and
rolls have not been turned
around."

*Taken from two recent
National Acme sales re-
ports. More information
upon request.

*Thread Rolls are reversible, having a
lead of 15 to 174 threads on both sides.

aren't you missing a bet if you don't put them
to the test on your threading machine?
Wherever the work calls for threading machined
parts from the end, there's no faster, better way than
"roll-em-on" with a National Acme (Pette) self
-roll-em-on" with a National Acme (Pette) self

These two reports show that National Acme (Pette)
Rolling Heads Thread Rolling Heads
are the answer to a production
day-out

tion engine
of the
consider that these threads
with smoother, more
at the

we ask us to prove that

for our recommendation

we ask us to prove that

for our recommendation

we ask us to prove that

for our recommendation

These two methods of opening the answer to a product show that National Thread Rolling is the answer to a productive day-out

Wherever the work comes, there's no faster, better, more reliable way to get the job done. That's why the National Acme (Petite) sells parts from the end, with a National Acme "roll-em-on" if you can be too) if you

then engaged pieces — you consider that those threads flow of the you consider with smoother, more And wear better threads, with no cratering at the heads give smooth surfaces, and wear resistant

(left) Thread Rolling
 on an automatic turret
 threading machine, drill
 heads and other types of
 hand lathed parts are
 pressed — quickly, they
 are horizontal — with
 SELF-OPENING TAPPING
 dies handle a range of
 sizes. And they are used
 in the production of
 OPERATE AT HIGH
 TOOL SPEEDS. (right)
 Capcutter 7 1/2" long
 expelling Type
 2 M.T.



THE NATIONAL
ACME COMPANY
AND S. ONIO.

170 EAST 121st STREET

ask us to prove that we can
print for our recommendation
to call.

For our records, please write to call.
If you need a copy of Catalog #101-53A?

**RIGHT ON SCHEDULE! 4 months and another 1,000,000
pieces later, the original set of rolls are still on the job. Have
you taken a close look at your threading picture lately?**

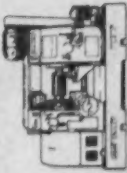
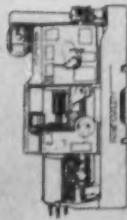
SEE US AT THE MACHINE TOOL SHOW • SEPTEMBER 6 TO 17 • BOOTH NUMBERS 324 AND 705

OUR JOB: to provide the *Right Machine* for your job

**THE NATIONAL
ACME COMPANY**

183 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley 4, 6 and 8 Spindle Automatic Bar and Chucking Machines • Fully Automatic Turret Lathes (Bar and Chuck Type) • Hydraulic Thread Rolling Machines • Automatic Threading Tools • Switches • Solenoids • Contract Manufacturing.



CINCINNATI Shears at

meet terrific



Materials being sheared in these illustrations are .093 Nimonic and .060" 5510 stainless steel.

Photos courtesy Pratt & Whitney Aircraft, East Hartford, Connecticut and Convair, San Diego, California.



PRATT & WHITNEY AIRCRAFT

demand for jet aircraft engines . . .



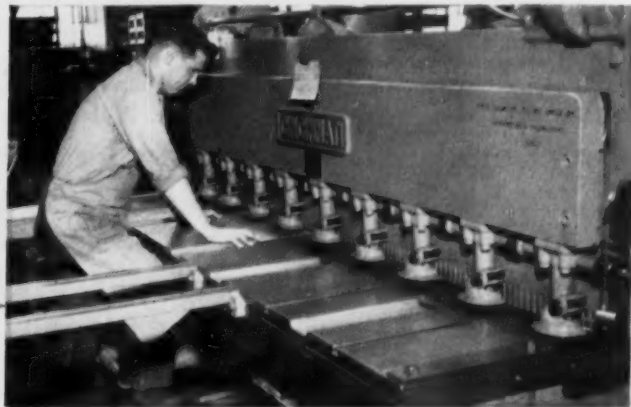
The right tools for the job were needed at Pratt & Whitney Aircraft, in their tremendous expansion, in the production of the highest power turbojets.

Cincinnati Shears are used in this program. Their accurate performance and ability to shear a wide variety of materials decided their selection.

Investigate:

- Cincinnati "Single Clearance" shearing
- Cincinnati Hydraulic Holddowns
- Cincinnati All-Steel Interlocked Construction

Write for complete Shear Catalogue S-6.



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES



FROM

J&B



1. 4-PURPOSE PRECISION PANTOGRAPH

The "*Panto-Miller*"

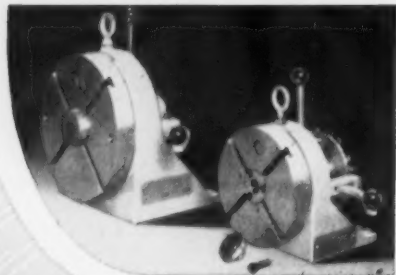
- Engraves
- Profiles
- Die Cuts
- Mills

A sturdy, production tool for 2-dimensional cutting in steel, cast iron, non-ferrous metals and plastics.

Pantograph reductions from 1:1 to 1:40. Spindle speeds infinitely variable from 1,200 to 11,500 RPM without belt changing.

Extreme accuracy and freedom of motion. Write for "Panto-Miller" details.

JOHNSON & BASSETT, INC. Production Tool Div.
BOX 1251, WORCESTER, MASSACHUSETTS, U. S. A.

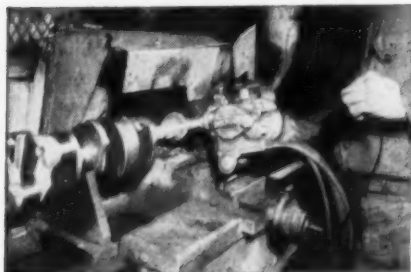


2. RAPID, ACCURATE JIG POSITIONING

This indexing trunnion, with station selector, accurately holds and locates either jig or work. SIMPLIFIES JIGS. REDUCES SET-UP TIME.

Ask for "TRUNNION" information

when mistakes happen...



Automotive crankshaft being brought up to inspection standards with metallizing. This automotive manufacturer formerly used plating for this type of salvage, worked one per hour. With metallizing, the salvage operation requires only 5 to 10 minutes per shaft, including surface preparation.

...and they do in any busy machine shop, there's no need to scrap a mis-machined or otherwise damaged machine part that represents an investment of many expensive man-hours.

Parts like these are brought up to inspection standards quickly, easily and inexpensively with metallizing.

And with the new molybdenum metallizing wire, Sprabond, the only surface preparation required is cleaning. The molybdenum forms a molecular bond with the surface being rebuilt. Little heat is generated, eliminating any danger of warpage.

What's more—users have found that the extreme hardness of the molybdenum coating, and its microscopic porosity which provides superior lubricating characteristics, improve its "wear-ability" over ordinary bearing surfaces as much as 25 times. You haven't just salvaged a part—you've improved it.



Free Bulletin

Get the full story on metallizing in production salvage. Bulletin 57-C describes and illustrates the procedures, provides data on typical parts, with interesting photo-micrographs showing the unique bonding action of Sprabond Wire. Send for a copy.

The trade name, SPRABOND WIRE, is the property of Metallizing Engineering Co., Inc.

DON A. WATSON
METALLIZING ENGINEERING CO., INC.
1111 Prospect Ave., Westbury, Long Island, N. Y.

- ☐ Please send me Bulletin 57-C.
☐ Please have Metco Field Engineer call.

Name _____
Company _____
Street _____
City _____ Zone _____ State _____



Metallizing Engineering Co., Inc.

1111 Prospect Ave., Westbury, L. I., New York • cable: METCO
In Great Britain:
METALLIZING EQUIPMENT COMPANY, LTD.—Chobham near Woking, England

For more data circle 292 on Reader Service Card

See it
at the Show
Booth No. 1402

the Moore-Fosdick

The only machine of its kind in

• Greater range—22" x 42" x 27" height • Automatically positions work to $\pm .0001"$

• Grinds jigs, dies, punches, templates and machine parts • Infinite Grinding Speeds—12,000 to 60,000 rpm
• Contour and Chop Grinding • Slot Grinding Attachment • Spindle-Housing Heat Control

This new machine combines the unique Moore Jig Grinding Head with the exclusive Fosdick Automatic Positioning Table. It gives you greater capacity for precision grinding with the speed and convenience of a table that automatically positions work to $\pm .0001"$. *There is no other machine in the world that even approaches the Moore-Fosdick in jig-grinding capacity, versatility, convenience and precision!*

Grinds Cylindrical and Tapered Holes. The Moore-Fosdick allows you to grind cylindrical as well as conical holes, with taper in either direction. An angular and indexing device built into the main spindle,

and the newly developed slot grinding attachment, permit the quick, accurate grinding of any contour—regular or irregular.

Large Work Capacity—Infinite Number of Speeds.

The Moore-Fosdick A. P. Jig Grinder has an infinite range of grinding speeds—from 12,000 to 60,000 rpm . . . allowing extreme versatility and accurate control of grinding and stock removal. Larger table size and greater work height, coupled with greater power, extend the overall range of precision grinding operations.

S P E C I F I C A T I O N S

| Capacity: | No. 30-G | No. 42-G & No. 42-PG* | Weights and Floor Space: | No. 30-G | No. 42-G & No. 42-PG |
|--|-----------|-----------------------|--|-----------|----------------------|
| Table size | 36"x18" | 44"x22" | Machine with regular equipment, including motor | 6000 lbs. | 11,000 lbs. |
| Table travel, Longitudinal | 30" | 42" | Shipping weight | 6750 lbs. | 12,000 lbs. |
| Table travel, Crosswise | 17½" | 22" | Floor space | 77"x82" | 102"x128" |
| Table top to wheel collet | 2" to 27" | 2" to 27" | Standard Equipment: | | |
| Spindle to column ways | 18½" | 18½" | Four speed constant torque ¼ hp motor, 220-440 volts, 50-60 cycles, 2-3 phase, wheel dresser—micrometer stop-wrenches. Two built-in locating devices: two 1" .0001 inside micrometers; two 1", 2", 3", 4", 5", 10" and one 15" end measurers in box. | | |
| Spindle to column below ways | 20" | 25¼" | Compressed Air Requirements: | | |
| Four spindle speeds: 90, 120, 180, 240 | | | 90 to 100 lbs. @ 15 cfm, furnished by customer. We recommend a heavy-duty 7.5 hp air compressor with a water after-cooler, provided it is capable of this output. | | |
| Spindle feeds by air-powered hydraulic control— | | | | | |
| infinite speed control | | | | | |
| Grinding speeds: 12,000 to 60,000 rpm; 3 heads | | | | | |
| Grinding Capacity: | | | | | |
| With grinding wheels, ¾" to 5" (8" with adapter) | | | | | |
| With diamond mandrels ¼" to ½" | | | | | |
| Travel main spindle slide | 3¼" | | | | |
| Angular adjustment of spindle up to 1½" either way or 3" included angle | | | | | |
| Radial offset of grinding spindle from center to 1¼" off center by rough adjustment—while running 0.0001" adjustment for distance of 0.075" anywhere in the 1¼" range. | | | | | |

*42-PG Moore-Fosdick Jig Grinder with Automatic Positioning.

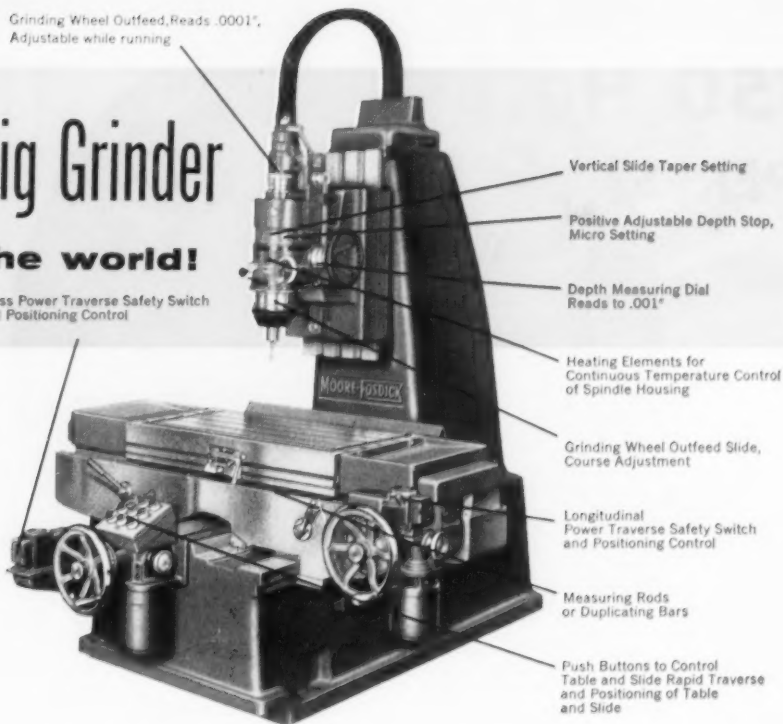
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Grinding Wheel Outfeed, Reads .0001",
Adjustable while running

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the world!

Cross Power Traverse Safety Switch
and Positioning Control



Vertical Slide Taper Setting

Positive Adjustable Depth Stop,
Micro Setting

Depth Measuring Dial
Reads to .001"

Heating Elements for
Continuous Temperature Control
of Spindle Housing

Grinding Wheel Outfeed Slide,
Course Adjustment

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Power Traverse Safety Switch
and Positioning Control

Measuring Rods
or Duplicating Bars

Push Buttons to Control
Table and Slide Rapid Traverse
and Positioning of Table
and Slide

Positions Work Automatically to $\pm .0001$ ". With the Automatic Positioning Table, you can get fast and accurate positioning of parts to be ground. Two simple duplicating bars may be prepared to position work automatically to $\pm .0001$ "—at the touch of a pushbutton. This means that complex grinding jobs with hundreds of holes require only one set-up. On "one-time" jobs, measuring rods can be used in place of bars. For precision production jobs, the easily-made, easily-stored duplicating bars give you a permanent record of positions. Once a job is run, you store the bars and use them every time you rerun that

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Grinder Head Dimensional Stability. Latest design of the grinding head incorporates new features to improve further its stability. These include: (1) Electric heating elements in the main spindle housing to maintain uniform temperature whether machine is running or not; (2) An observation thermometer so located as to indicate any temperature change within the housing; (3) The housing itself is cast from 36% nickel iron to reduce the effect of any possible temperature variation to an irreducible minimum.

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Radial
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For more data circle 294 on Reader Service Card

June, 1955

modern machine shop 91

150 HOLES PER STROKE



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Punching 150 holes ranging from .078 inch to .250 inch in size at one time, is a job easily done on Cleveland Steelwelds.

Clearance between punch and die illustrated, was held to .0015 inch to avoid burrs. The punches are individually gaged and gauged, with built-in strippers, set to accurate scale readings and as close as $\frac{1}{16}$ -inch centers.

For supporting the sheets during punching, this machine is provided with a special table and micrometer gauge which is operated by a handle at front of press just below top of bed.

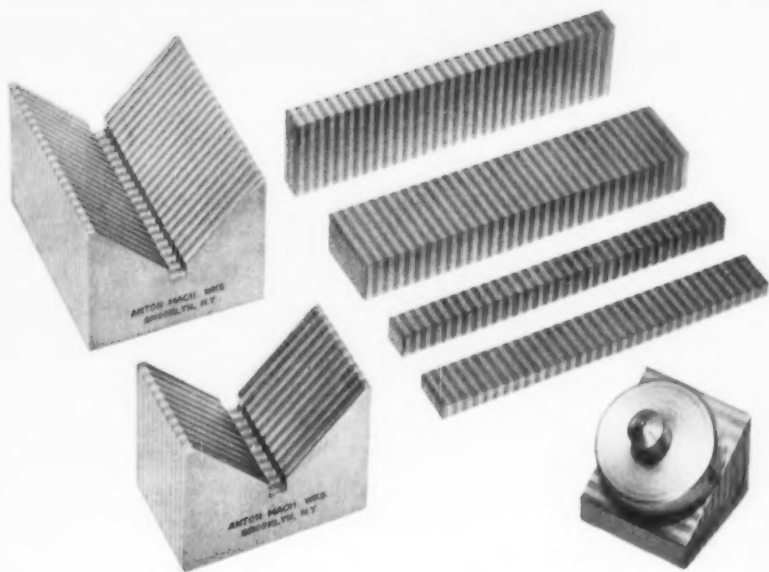
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**Parallels, V-Blocks,
Adjustable V-Blocks,
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- Eliminate expensive grinding set-ups.
- Speed up production.
- May be cut and shaped to fit your job.
- Highest Quality — Reasonably Priced.

Write for illustrated catalogue sheet, listing prices, features and specifications

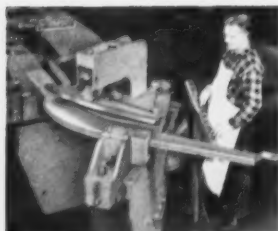
Anton Machine Works

1226 FLUSHING AVENUE • BROOKLYN 37, NEW YORK

For more data circle 296 on Reader Service Card

HOW MAJOR INDUSTRIES NOW CUT

Product Costs

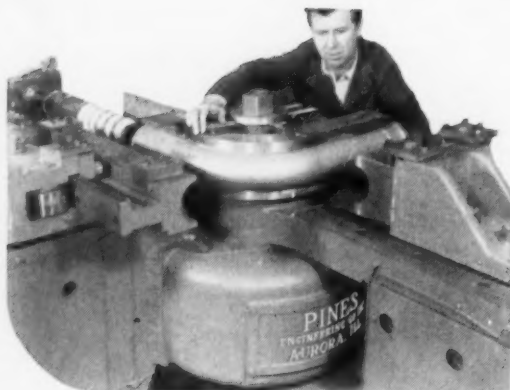
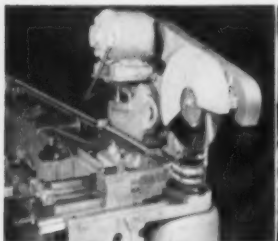


- 2** **HOLLOW TRACTOR BOOMS**—Cold bending 13 ga. welded steel tapered tubes without distortion on Size 4 Pines and eliminates expensive blanking and forming dies, saves tons of material for farm equipment manufacturers.



- 3** **EXTRUDED WINDOW FRAMES**—Part of production line setup in large aluminum fabricating plant, this small Pines Semi-Automatic saves space, accurately bends automobile window frame moldings.

- 4** **REFRIGERATION AIR CONDITIONING ELLS**—Special Pines Automatic Cut-Off Benders now produce copper ell and return bends at speeds up to 1500 per hour, reduce scrap losses to 1%.



- 1** **AIRCRAFT TUBING**—Smooth, extra sharp bends now produced in ultra-thin stainless steel tubing, saves space and \$14,000 per plane for aircraft manufacturer. Shown above, Pines Size 4 Unit forming wrinkle-free 8" c/l radius bend in 4" x .020" S. S. tubing.

with PINES PRODUCTION BENDERS

The examples shown here are a few of the countless number of production jobs that are now handled efficiently and more profitably on Pines Automatic Benders. They illustrate the versatility and the many cost-cutting advantages of cold forming round, square, rectangular, extruded, or hollow stock the "Pines-Way". Simplicity of tooling, uniform accuracy, and ease of operation are proven features of Pines machines which today help hundreds of plants cut product costs. At Pines you'll find an unmatched wealth of bending experience and creative tooling skill readily available to help you develop better methods and save time on production problems.

Write for
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To keep abreast with latest developments in bending, write for copies of "Pines News"—a monthly mailing piece that gives facts on new, cost-cutting bending applications.



PINES

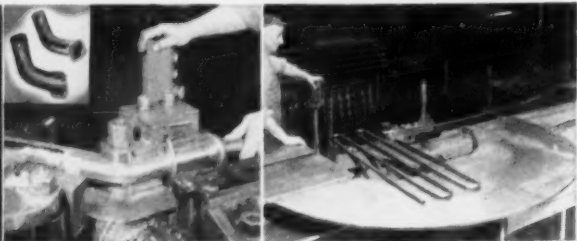
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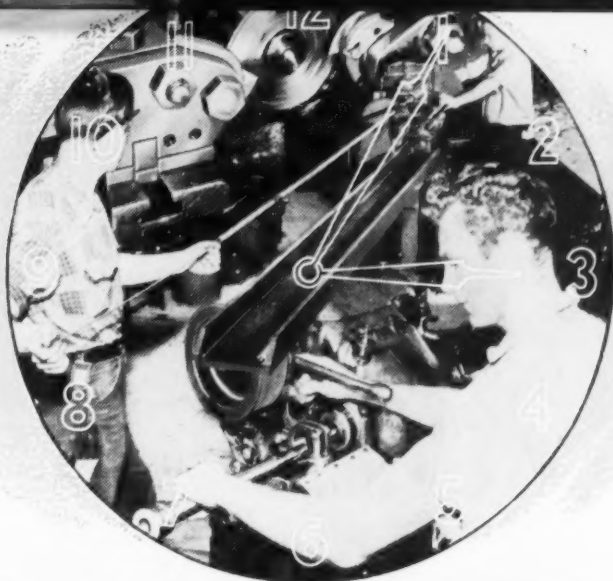
642 WALNUT • AURORA, ILLINOIS

- 5** **ENGINE MANIFOLD TUBES**—Shed 1 1/2" O. D. steel tube now bent to 1 1/2" c/l radius with flange attached saves space, improves accuracy, cuts costs.

- 6** **BOILER TUBE AND REFRIGERATION COILS**—Typical setup bending continuous serpentine coils from 1/2" steel tubing. Reduces welding, fabricating costs. Other installations range from 1/4" copper up to 3" steel tube.



For more data circle 297 on Reader Service Card



Why let the 4th DIMENSION limit your screw machine tool output?

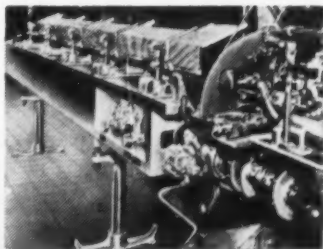
A trip to the washroom or tool crib, a halt for feed finger repair, a spinning empty chuck — these interruptions to the steady flow of production can never be made up . . . for TIME, the 4th Dimension, waits for neither man nor machine.

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1/4 H.P. CONVERTICAL MILL HEAD

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High speed medium-light operation.

For bench, floor and pedestal mills.

Fits milling machines with overarm 1 1/2" to 3".

3/8" end mill capacity.

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Fits milling machines with 3" to 5" overarm.

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For vertical, horizontal and angular operations.

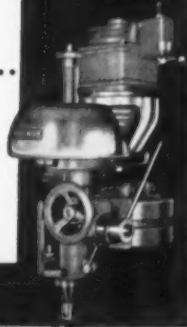
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For vertical, horizontal and angular operations.



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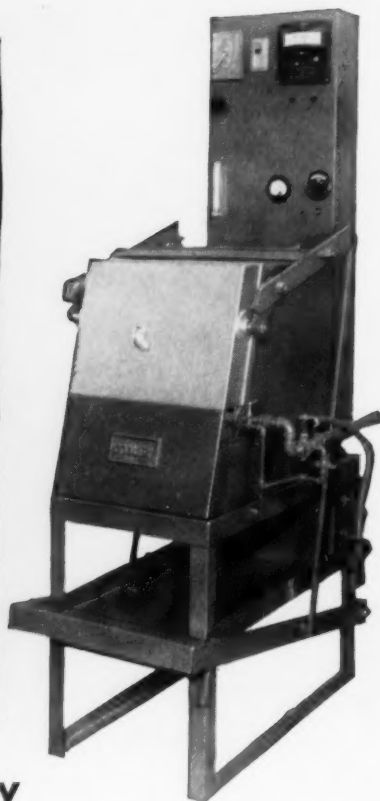
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controlled
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heat treating
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—designed especially
for tool rooms and small production

This new Cooley GA-3 electric is the first small furnace to provide atmosphere protection with a reasonable investment and low operating costs. The atmosphere is generated by cracking alcohol and water of proportions predetermined to suit the application. Steel may be clean hardened without decarburization, or may be carburized.

As a package unit, the Cooley GA-3

includes a fully wired temperature control panel and atmosphere generating unit. A sealed alloy retort with tightly closed door, automatic gas curtain and foot operated door mechanism are other features that help assure dependable, economical operation—with little adjustment required. Write or wire for catalog—investigate the possibility of this new furnace for your work.

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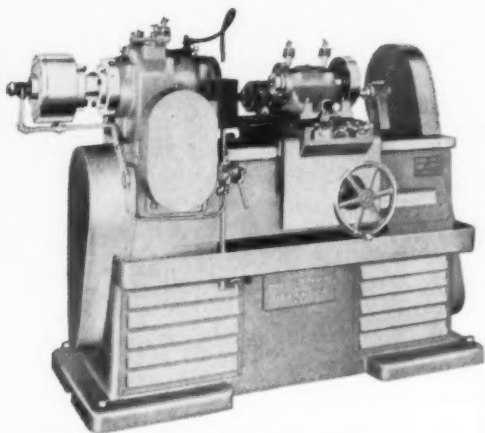
- HEAT TREATED MATERIALS

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- VERY SHORT RUNS

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ONLY THE COULTER "H1" GIVES **ALL THREE!**



EXTRA For Brass, Aluminum and Steel.

The "H1" makes provision for a separate motor to give the cutter and work spindle a larger range of speeds and feeds for threading these materials.

Machine Tool BUILDERS Since 1896

Yes sir, the COULTER "H1" Hob Thread Milling Machine is the only completely automatic machine that has such outstanding exclusive features for producing precision internal and external right-hand and left-hand threads — **ON A PRODUCTION BASIS!**

In addition, it's (a) fully **AUTOMATIC**, (b) works equally well with universal or air operated chucks, or, special fixtures, (c) has work spindle with an extra large hole, (d) work can be inserted from face to rear end, (e) has pick-off gears and adjustable sheave drive.

It's the machine for you!

Send for complete information on the "H1" and other Coulter Automatic Threading Machines — no obligation.

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OVER THE EDITOR'S DESK . . .



SHOW OF SHOWS

Advance information received from the National Machine Tool Builders' Association indicates that there will be more than 166 exhibitors at the National Machine Tool Show and more than 175 exhibitors at the Production Engineering Show to be held simultaneously in Chicago, September 6th to 17th.

The Machine Tool Show will be held in the International Amphitheatre, to which a new Exposition Hall has been added to accommodate the Show; and the Production Engineering Show will be held on the Navy Pier. A scheduled helicopter passenger service, the first of its kind ever arranged anywhere for exposition visitors, will carry businessmen between the Navy Pier, where the Production Engineering Show will be held, and the International Amphitheatre, where the Machine Tool Show will be staged. With more than 100,000 executives expected for the concurrent events, fleets of busses also will operate between Loop hotels and the two exhibition halls, and other busses will operate on round trips between the Pier and the Amphitheatre.

"Many more large machines will be on exhibit in this Show than in the 1947 Show," reports Tell Berna, General Manager of the National

Machine Tool Builders' Association. "There will be a larger number of transfer machines and more big presses."

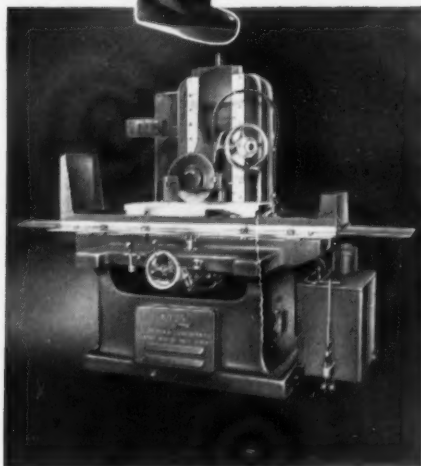
"What will probably strike visitors to the Show as most impressive will be the amazing progress made in the last few years in the development of automatic operations and controls. Of equal interest will be advances in accuracy. We are entering upon a period in which men will talk of millionths of an inch as casually as of thousandths of an inch—with not only machining skills but actual rate of productivity built into the machines themselves."

The United States Government lists 441 distinct types of machine tools—not to mention various sizes and combinations. Practically all of these will be on display at the Show, in operation.

Exhibits at the Machine Tool Show (except for the trade press) will be confined entirely to machine tools. Meanwhile, the Production Engineering Show, on the Navy Pier, will display mechanisms, instruments and equipment that contribute to greater automaticity of industrial production and processing. This Show will be concerned not only with metalworking, but will extend across the whole field of pro-
(Continued on Page 103.)

FOUND WHERE WORLD FAMOUS AIRCRAFT ARE "BORN"

GRAND RAPIDS GRINDERS



GRAND RAPIDS NO. 55 HYDRAULIC FEED SURFACE GRINDER
This precision tool room type machine has table speed up to 125 fpm. Working surface of table is 12" x 36". Vertical movement of wheel head 18". Preloaded ball bearing spindle greased for life. Spindle speeds 1925 and 2500 rpm.



Just a note on your letterhead will bring you full details.

Just take a look in their toolrooms! Every one of these famous aircraft manufacturers uses Grand Rapids Grinders . . . engineered and built for unusual long life of precision grinding. Our Model 55 shown here, for instance, features column and base of massive, one-piece casting for vibrationless rigidity and permanent alignment. Both longitudinal table travel and cross feed are hydraulically actuated. Wheel head has powered rapid vertical travel. Table speed is variable up to 125 fpm . . . faster than any other of this type and size.



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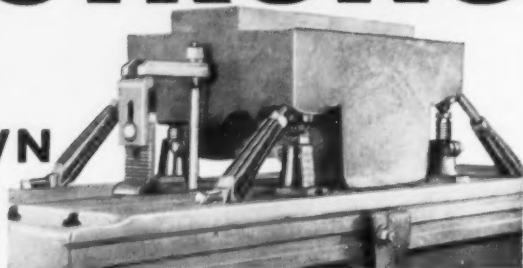
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June, 1955

modern machine shop 101

ARMSTRONG

SET-UP *and* HOLD-DOWN TOOLS



**PLANER
JACKS**



**NON-SKID
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**STEP
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UNIVERSAL CLAMP



T-SLOT BOLTS AND NUTS



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Your local Armstrong Distributor carries ARMSTRONG Set-up and Hold-down Tools in stock in sizes for every operation. Stop haphazard setting-up methods. Provide each of your machines with a full complement of ARMSTRONG Set-up and Hold-down Tools.

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"The Tool Holder People"

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T-SLOT CLAMP



(Continued from Page 100.)

duction to include all types of manufacturing. Products to be exhibited will include, for example, electronic devices, air gages, conveyors, brakes, clutches and drive mechanisms, weighing equipment, chucks, dies and jigs, lubricating systems, and so on.

Inaugurated this year in conjunction with the Machine Tool Show, the Production Engineering Show is planned to be continued as an annual exposition.

"Not in years," says William E. Rutz, Executive Vice President and Works Manager, Giddings & Lewis Machine Tool Company, Fond du Lac, Wisconsin, and Chairman of the Show Committee of the National Machine Tool Builders' Association, "will executives concerned with the problems of cost reduction have such an opportunity to study ways and means of cutting cost per piece produced as that offered by these two shows. They will constitute a gigantic demonstration of increasing productivity."

Hours of both shows have been coordinated to permit visitors to make maximum use of their time. The Machine Tool Show will be open from 10 a.m. to 5:30 p.m., while the Production Engineering Show will operate from 1 to 10 p.m.

The American Machine Tool Distributors' Association will operate an information and message center at the Machine Tool Show, according to H. Habicht, Chairman of the Association's Show Committee and Vice President and General Manager of Marshall and Huschart Machinery Co., Chicago, Illinois. The

Association booth, which will be located between the Show's two registration areas on the second floor of the International Amphitheatre, will provide a variety of services for builders and guests attending the Show.

The Distributors' Show Committee will be assisted by members of the Association in operating the booth, so that someone will be in attendance at all times. Personnel will receive and post telephone and other messages on a system of bulletin boards. Uniformed messenger service will be provided. In addition, the booth will function as a complete information center for the Show, and will also provide information about Chicago.

Running concurrently with the Machine Tool Show and Production Engineering Show will be the Coliseum Machinery Show to be held at the Chicago Coliseum. Information thus far received indicates that there will be more than 62 exhibitors at this Show, where practically every type of product and metalworking machinery available today, along with specialty machines and a wide assortment of equipment items, will be displayed.

The Coliseum Machinery Show, the Machinery Tool Show, and the Production Engineering Show are three events of prime interest to the readers of *Modern Machine Shop*; therefore, we strongly urge all production executives and others responsible for or associated with metalworking operations to be in Chicago in September to attend these three great shows. Remember the dates—September 6th to 17th.

COATED ABRASIVE MACHINES IN CLOSE TOLERANCE WORK • By A. W. Bell

The discussion covers outstanding production applications of coated abrasive machinery capable of removing metal rapidly to extremely exacting tolerances. Page 106.

NEW DIE STORAGE FACILITIES SAVE FACTORY SPACE • By Gilbert C. Close

The author discusses the operation and advantages of a new method of storing and handling machine tool dies now in use at Douglas Aircraft's El Segundo Division. Page 110.

LOOSE BIDS MEAN LOST PROFITS • By Robert J. Flynn

Some words of caution relative to the increasing number of careless bids being made by many firms on contracts are presented in this enlightening article. Page 116.

WELDING PAPER ABSTRACTS

Abstracts of several of the papers to be given at the National Spring Meeting of the American Welding Society, June 7-10, in Kansas City, Missouri, are presented. Page 122.

NEW MACHINE EXTENDS THREADING ROLLING PROCESS

This article discusses a two-roll design principle which is applicable to the threading of a wide range of workpieces. Page 128.

UNUSUAL DUST COLLECTOR INSTALLATION CONSERVES PLANT SPACE • By W. W. Peterson

Mounting of dust collecting units on floors below grinding, finishing and polishing departments solves plant space problem at Yankee Tools. Page 132.



**FEATURES
IN THIS
ISSUE**

AUTOMATIC CRANKSHAFT MACHINING

Newly developed four-station transfer machine automatically performs ten operations on automobile crankshafts. Page 134.

SPLINE HONING HARDENED GEARS

In the job described, gears are processed so that the bearing surfaces of the splines are generated concentric with the pitch of the teeth. Page 136.

INCENTIVE SYSTEM APPLIED TO GRINDING OF EXPENSIVE RACES

Well-engineered system at The Timken Roller Bearing Company encourages operators to work faster—but not so fast as to risk ruining \$1500 bearing parts. Page 144.

RESHARPENING LARGE DIES

High precision surface grinders having special length tables quickly resharpen large blanking dies. Page 150.

PLANING BOILER PLATE

H-P-M Company reduces planing time on S.A.E. 1045 normalized boiler plate with carbide tooling. Page 152.

PRACTICAL METHODS OF STEEL

IDENTIFICATION * By Howard E. Boyer

In this concluding installment, the author discusses permanent magnet tests, spot tests and heat treating tests as simple means of steel identification. (Ed. Note: If you do not have a copy of the first part of this article, we shall be glad to send you tear pages of same.) Page 156.

**FEATURES
IN THIS
ISSUE**



Coated Abrasive Machines

Outstanding production applications of coated abrasive machinery capable of removing metal rapidly to extremely exacting tolerances.

By A. W. BELL

Midwestern Manager, Behr-Manning Div.,
Norton Co., Troy, N. Y.

Machine designers, as industry is now discovering, were quick to capitalize on the performance potentials of coated abrasive belts. They designed machines capable of meeting mass production requirements, whether in rapid stock removal or in precision finishing and polishing. Today, there is a machine available for just about every type of work involving coated abrasive belts; and tolerances can be readily held within

limits of 0.0005 inch to 0.002 inch.

For example, the Engelberg-Huller wet-dry belt grinder shown in Fig. 1 is being used for repeat operations in mass production—grinding matching surfaces of saw housings to overall flatness and removing stock to tolerances of ± 0.0005 inch. The grinder has an automatic feed table with a micrometer stop which moves horizontally and is automatically actuated. When the table moves from loading to grinding position, the hydraulic control goes into action. There is a quick approach, followed by a slower in-feed down to the micro-stop limit. When the table is retracted to loading position, the hydraulic feed is reset for the next operation. The machine uses an 8 x 107-inch coated abrasive belt.

The unit shown in Fig. 2 is designed for grinding workpieces such as flat stampings and forgings to tolerances of ± 0.0005 inch. Metal slats on the horizontal conveyor belt hold the workpieces when they are in contact with the vertical abrasive belt. A flat steel platen under the conveyor belt



Fig. 1—Engelberg-Huller wet-dry belt grinder is shown being used for grinding matching surfaces of saw housings to overall flatness, removing stock to tolerances of ± 0.0005 inch.

s in Close Tolerance Work

maintains flatness and selected grinding depth. Work area on top of the conveyor belt is 4 x 96 inches. This machine also has dynamically-balanced high-speed wheels and an air mechanism that maintains uniform belt tension.

Precision is featured in the Engelberg-Huller centerless wet-belt grinder shown in Fig. 3, a unit capable of holding tolerances of ± 0.0005 inch on cylindrical and tubular stock. The working arrangement consists of a 4 x 54-inch vertical abrasive belt, a resilient contact wheel, a regulating wheel, and a work rest blade. The rubber covered contact wheel which backs up the abrasive belt is interchangeable and is made in varying degrees of hardness. Adjustability of the regulating wheel provides a range of angular setting from zero for plunge grinding up to 35 feet per minute for through-feed work. A micro-stop provides size control.

Steel, brass and aluminum sheet and coil can be production polished to within ± 0.0005 inch with the Murray-Way 30-inch micro-polishing units shown in Fig. 4. Surface finishes of 5 microinches can also be attained. The abrasive belt, positioned vertically, is held against the work by a contact roll, the work being supported from below by a billy roll. The machines shown are arranged in tandem and a series of

coated abrasive belts will rough, intermediate polish and finish. Belts are oscillated by air-operated mechanisms.

The specially designed Engelberg-Huller wet-dry grinder shown in Fig. 5 fits into the trend toward more automated production grinding and polishing. It employs a vertical 8 x 107-inch abrasive belt and a chain-link mechanism which moves twenty-one $3\frac{3}{4} \times 6\frac{1}{4}$ -inch fixture plates horizontally into position for grinding stamped knife handles to fine tolerances. Each fixture plate rides on hardened shoes and rails as it passes over the leading edge of the abrasive belt. The work is advanced quickly to the surface of the belt, is fed slowly into the abrasive during



Fig. 2—The Murray-Way micro-polishing unit shown in this illustration is designed for grinding workpieces such as flat stampings and forgings to tolerances of ± 0.0005 inch.

"The idea of using two coated abrasive belts . . . is rapidly making headway."

passage across the belt, and is retracted quickly just before leaving the belt's trailing edge. Small parts are loaded on fixture plates manually but ejection is automatic and at a rate of 2,000 pieces per hour.

The Hammond heavy-duty wet grinder shown in Fig. 6 uses an 8 x 107-inch vertical abrasive belt with a water-cooled platen, a tilting work holder, and a power reciprocating table that moves the work horizontally toward and away from the belt. Grinding is held to tolerances of 0.0015 to 0.002 inch, a dial indicator showing amount of stock removed.

The idea of using two coated abrasive belts on one unit as a means of machine simplification, reducing handling and increasing unit production, is rapidly making headway. Production Machine Company now has two machines on the market for just this purpose. One machine has two vertically arranged abrasive belts set up opposite each other for deburring and surfacing both sides of rectangular work in one pass to a tolerance of ± 0.0005 inch. Both abrasive belts are backed by flat platens, one platen adjustable for work thickness and both platens



Fig. 3—The Engelberg-Huller centerless wet-belt grinder shown herewith is said to be capable of holding tolerances of ± 0.0005 inch in grinding cylindrical and tubular stock.

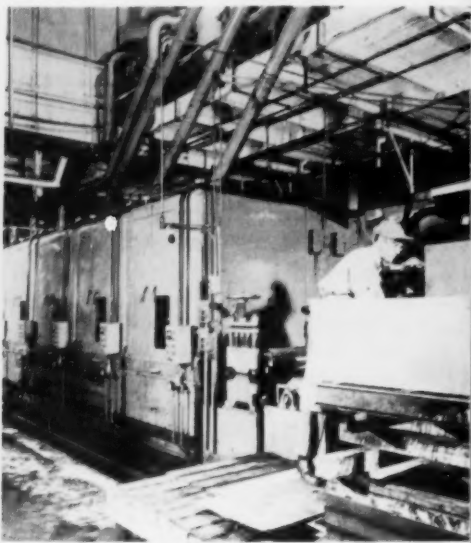


Fig. 4—Steel, brass and aluminum sheet and coil can be production polished to within ± 0.0005 inch with the Murray-Way 30-inch micro-polishing units shown herewith.

adjustable for different kinds of work. Chutes or similar fixtures convey workpieces to and from the abrasive belts.

The same company uses two belts in its recently designed centerless grinder. The grinding medium on one job is a vertically arranged 50-grit 9 x 168-inch abrasive belt backed up by a steel contact wheel. Instead of a conventional regulating wheel, this machine uses a 220-grit aluminum oxide belt to feed the work past the grinding belt, which may be run at speeds up to 10,000 s.f.p.m. A flat steel platen forces the regulating belt against the work. An outstanding advantage of the abrasive regulating belt is that it can be instantaneously varied from 0 to 15 degrees to provide feed rates

from zero for plunge grinding operations to 30 feet a minute. Shaping of regulator wheels is claimed to be eliminated.

Still another twin-belt design by Production is a duplex centerless wet grinder for grinding and polishing straight or tapered stock up to 1½ inches in diameter. In this case, the vertically arranged belts are side by side and impart successively finer finishes to the work.

From these, and other designs currently being introduced to industry, it is obvious that designers are seeking to build a greater degree of precision and flexibility into coated abrasive belt machinery. Add ingenious fixturing to this basic improvement and even greater gains in unit productivity are possible.

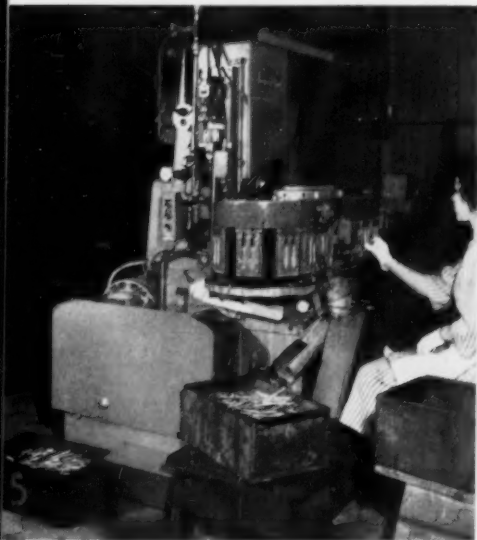


Fig. 5—This specially designed Engelberg-Huller wet-dry grinder is particularly adapted for the automatic production grinding of stamped knife handles to fine tolerances.

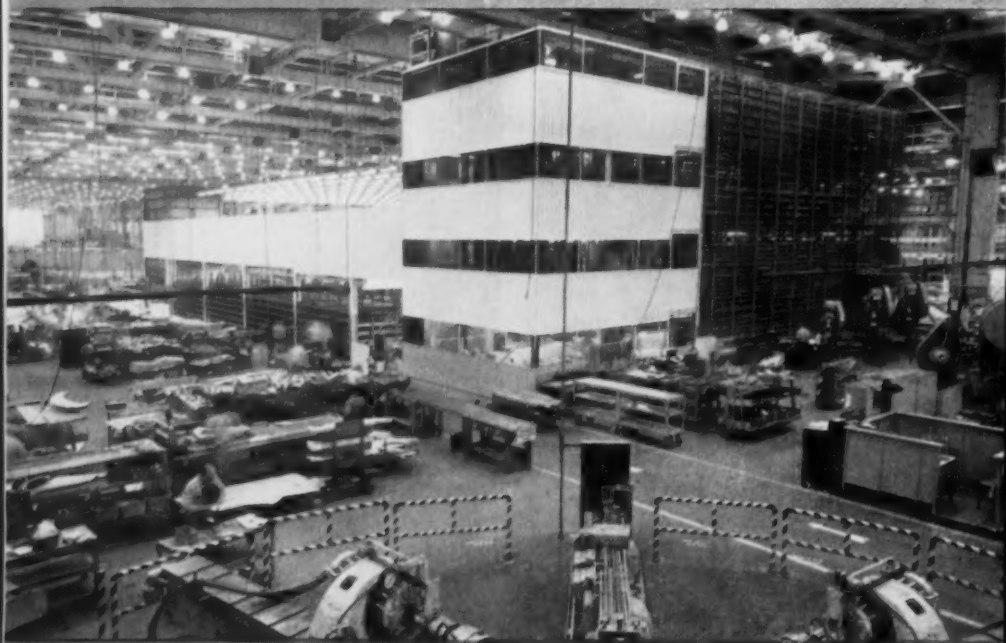


Fig. 6—On this Hammond heavy-duty wet grinder, grinding is held to tolerances of 0.0015 to 0.002 inch, a dial indicator showing the amount of stock being removed.

New Die Storage Facilities Save Factory Space

In which the author discusses the operation and advantages of a new method of storing and handling machine tool dies now in use at Douglas Aircraft's El Segundo Division.

By GILBERT C. CLOSE



This illustration provides a general view of the multi-story die and tool storage tower in the plant of Douglas Aircraft Company's El

Segundo Division as it was nearing completion. The total floor space which is occupied by the huge tower measures 30 by 70 feet.

As one Douglas engineer put it, "With factory space worth \$25 a square foot, it pays to grow up, not out."

A new method of storing and handling machine tool dies, now in use at the El Segundo Division of Douglas Aircraft Company, fulfills the main requirements of practically any industrial accomplishment — space-saving, time-saving, cost reduction and efficiency. This same system, perhaps with minor modifications, could be installed in at least 90 per cent of all plants where die storage and handling problems exist.

Some outstanding features of the new Douglas system are described in the following paragraphs. More than 71,000 pieces of tooling are individually stored on shelves or racks in a four-story multi-frame tower which occupies a small 30 by 70-foot floor area. Manual labor in handling the tools is reduced to a minimum by the use of roller shelving, roller tables, monorail power lifts, and a "dumb waiter" installation which serves the various floors of the new tool storage tower.

During an average eight-hour work shift, eight employees fill orders for about 2000 individual pieces of tooling to satisfy some 400 production orders, and restore the same number of tools that are returned during that interval. Files maintained by three record clerks indicate at a glance where each of the 71,000 tools is at any specific time.

The need for these new, more compact, and more efficient die handling and storage facilities grew out of the company's vast expansion program and current heavy production sche-

dules, including, in addition to spares for former models, parts for six different military airplanes currently in production. The heart of the new die storage system is the all-steel, four-story, multi-frame tower with its adjustable shelving. The upper three stories of the tower have expanded steel mesh floors. Two "dumb waiters," each large enough to contain any tool stored on the upper floors and operating side-by-side in a single elevator shaft, handle the



A tool handler is shown in the process of sliding a heavy die from a shelf directly onto a lift platform on a monorail-mounted lift truck.

"Roller-type shelving is used . . . to facilitate moving the dies into and out of storage."

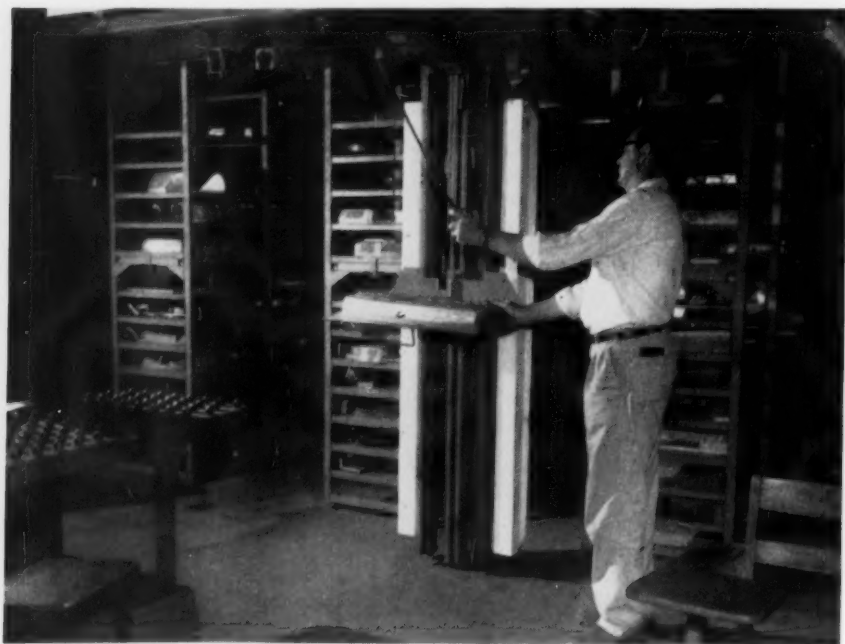
tools up from and down to floor level. A ball table on each floor faces the "dumb waiter" opening so that heavy tools may be easily rolled into the lift.

A monorail-mounted power lift on each floor may be shuttled into any of the aisles between the shelving and then adjusted in height so that the tool can be slid directly off the shelf onto the lift platform. After moving the lift to the ball table and

adjusting its height, the same tool can be slid directly off onto the table and into the "dumb waiter."

Only sheet metal templates and light form dies are stored on the upper floors. Class A dies and heavy Hydropress dies are stored on the floor level. Roller-type shelving is used on the floor level to facilitate moving the Hydropress dies into and out of their storage position.

A small two-story structure ad-



In this view, the monorail-mounted lift has been moved out onto the sliding "bridge" or track section which can be shoved in either direction to match up with the monorail track

in any aisle. The ball table onto which dies are loaded from the lift is visible at the far left in the illustration. The dies move across this ball table into a "dumb waiter" elevator.

jacent to the four-story tower contains a die and form block repair department on its upper floor, while 12-foot high shelving on the lower floor is used for the storage of heavy Class A dies. These Class A dies are stored on pallets with a maximum load limit of 2500 lb. per pallet. When a Class A die is needed, a Trans-stacker lift truck is used to remove the pallet from the shelves and lower it to a position where the die can be slid off onto the lift of the truck that will transport it to the required department.

Two shuttle trucks maintain a continuous schedule between the die

storage facilities and the departments where the tools are used. These shuttle trucks load directly from the roller shelving on the floor, or from a roller table in front of the "dumb waiter" shaft onto which dies from the upper story are delivered. The Class A dies are loaded directly from the pallet removed from the shelf by means of the Trans-stacker truck.

All dies are indexed as to the floor on which they are stored and their storage position on that floor. Each of the two "dumb waiter" lifts has two compartments. These compartments are numbered according to



A Trans-stacker is shown being used to remove pallet from shelves containing heavy Class A dies. The required die is then slid from this pallet directly onto the lift platform

of the truck that will transport it to the department where it will be used. Each pallet is designed so as to readily accommodate a maximum work load of up to 2,500 pounds.



The third floor compartment of the "dumb waiter" lift delivers a load of small dies to the third floor for restorage after use.



A die which has just been unloaded from the lift of a truck is shown being slid easily by means of two Douglas Aircraft workers across the ball-top table into the receiving station.

"... two outstanding advantages — time-saving and space-saving—are obvious."

the floor they serve so that the tool handler on each floor knows immediately whether or not a returning tool is for his floor.

Keeping track of 71,000 pieces of tooling is no mean task; yet this has been reduced to a simple operation. When an order for a tool is received, duplicate forms are made out indicating the tool, its number, its location in storage, and the ordering department. One copy goes with the tool; the other is retained and filed in the department. When the tool is returned, this "out" record is merely removed from the file and destroyed. Thus, a tool is merely "in" or "out," and if it is "out," information relative to where it is is always on hand.

The tools stored in the new facility include punch-press and Hydro-press dies, form blocks, contour templates, trim tools, and trim-and-drill fixtures. Stretch press dies and drop hammer dies are stored outdoors to conserve factory space.

The tool repair department already mentioned simplifies tool maintenance. When a tool or form block returns in a damaged condition, it goes directly to this repair department from which, after repair, it is returned to its proper stored place.

The advantages of this new facility for die handling and storage over the older method of storing all tools on 12-foot high wood shelving are too numerous to list in detail. But the two outstanding advantages —

time-saving and space-saving — are quite obvious.

The simple, integrated handling techniques assure that tools will be delivered on time to the department where they are needed, thus minimizing production machine down time. Four level storage facilities permit about four times as many tools to be stored in a given area than was possible with single level storage.

And as one Douglas engineer tersely put it, "With factory space worth \$25 a square foot, it pays to grow up, not out. The new four-story tower storage facility serves this purpose. We now effectively utilize overhead factory space which was formerly going to waste."



Heavy Hydropress die is shown being slid from roller shelving onto lift of small truck which will transport it to the Hydropress.

★ ★ ★ ★ ★

Coated Abrasives Grinding and Polishing Techniques. To help industry solve modern grinding and polishing problems and to suggest new and practical methods, Behr-Manning Corp., Dept. PD-54, Troy, N. Y., has published a 60-page handbook, entitled "Production Digest," which includes authoritative papers on coated abrasive grinding and polishing techniques. It is believed to constitute the first effort on the part of a coated abrasives manufacturer to compile a handbook of the art and is assembled from 20 technical papers prepared by Behr-Manning methods engineers during the past two years for the leading periodicals of production engineering in both the metalworking and the woodworking fields.

Subjects covered in the handbook

include coated abrasives theory and practice; contour polishing and grinding; the inside polishing of recesses and small openings; the conversion of polishing jacks to belt usage; contact wheels; part sizing and deburring; swing frame grinding; cylindrical stock grinding; abrasive belt lubrication; disc grinding problems; tolerance grinding of wide sheets; abrasive strapping techniques; special abrasive cloth shapes and their uses; the cutting of spiral-wound abrasive drum covers; the modern use of coated abrasives in wood finishing; and suggestions on cost cutting in production practice. The handbook is available without charge on request by writing on company letterhead to Behr-Manning at the address listed above.

For more data circle 1 on Reader Service Card



By ROBERT J. FLYNN

Words of caution relative to the increasing number of careless contract bids.

A few months ago a Contract Board in one of the Government's defense bureaus was going over some bids on a large number of items which they purchased annually. They finally came to one item, a bell, which they had been buying for a number of years and on which there had never been a change in specifications. They knew that the casting on the bell, which had to be of aluminum, alone cost at least \$11.00. For years the bids had always been between \$18.00 and \$25.00.

At first it seemed apparent that this award would ultimately fall in the same range. *In view of the past experience, it is easy to picture their startled expressions when one bid was read as 16 cents.*

"You mean \$16.00 don't you?" said one of the contract men.

"No," his colleague replied. "The

bid reads sixteen cents (\$.16)."

"This fellow must have quoted on the wrong bid or else it's a typographical error. Better send him a wire and ask him to confirm that he bid on '9-2S'."

After dictating and dispatching the wire, the board went over the other bids to determine which bidders should be given further consideration. But, if they were startled when they opened the bids, they were completely astounded when they got an answer confirming the sixteen cent bid and confirming the bid number.

At this point they got out the copies of the notices and the specifications and went over them minutely. They ran a check on the Midwestern manufacturer who had submitted a bid equal to less than one per cent of the average bid on the

**Watch those careless bids on contracts. They can cost
you a lot of money!**

item and determined that he was an occasional bidder on other types of items.

Finding nothing out of the ordinary except the bid they immediately sent out the following wire:

"REVIEW OF BIDS SHOWS YOU TO BE LOWEST BIDDER. HOWEVER SINCE THERE ARE INDICATIONS THAT YOU MAY HAVE MADE SOME ERROR IN BIDDING YOU ARE HEREBY GIVEN THIRTY DAYS TO WITHDRAW BID."

Back came the answer:

"THIRTY DAY OPTION WAIVED. BID STANDS. AWAITING CONTRACT."

Still convinced that there was some tragic error somewhere and not wishing to take advantage of someone who had apparently made a mistake, another wire went out inviting the manufacturer to come to Washington to negotiate the

terms of the contract. When he arrived just about everybody connected with the job was sitting in the conference room. Perhaps some phenomenal revelation was going to be made.

The Government man who was chairman of the meeting opened it by saying, "Our past experience shows that the item you have bid on should cost considerably more. Are you certain you have read the bid carefully?"

"Of course," said the manufacturer, looking very annoyed. "I don't know what all this fuss is all about over a little inexpensive bell."

"Well, it hasn't always been inexpensive, Mr. Carter," replied the contracting officer. "Perhaps you have a sample of what you intend to supply with you."

"Sure," said Mr. Carter, and reaching into his briefcase he produced a simple kitchen door-bell.



"... it is easy to picture their startled expressions when one bid was ... 16 cents."



"See right here . . . Needless to say, the cigar almost fell out of Mr. Carter's mouth."

"The ridiculous bid is a source of annoyance for many reasons."

As all the members of the Government agency gaped at the object on the table, Mr. Carter, looking very self-satisfied leaned back and lit a cigar.

Finally one of the Government engineers leaned over and said, "How loud will that bell sound?"

"I don't know," said Carter, "How loud does any kitchen bell sound?"

"Well our bell is to have a sound equal to 95 decibels," answered the engineer, testily. "Furthermore I don't think this bell would operate after being submerged in eight feet of water for 24 hours, do you?"

"Of course not," said Carter, "but"

"And that's a six-volt bell isn't it?" said the engineer.

"Why, yes, but I don't know what all this has"

"Well our bell must operate after submersion for 24 hours in eight feet of water, must be 110-120 volts and have a sound equal to 95 decibels. In addition, it must be mounted on an aluminum base and aluminum hous-

ed. See right here in the specs."

Needless to say, the cigar almost fell out of Mr. Carter's mouth. It wasn't until then that he realized that he was faced with a ruinous loss. He admitted he had just looked at the print of the bell and saw that it had the same general outline of the bell on the conference table. He thought that he couldn't lose by sending in a bid and figured that a nice simple order like that could "keep his finger in the pie." However, now that it looked like the pie might be a painful source of industrial ptomaine poisoning, he adopted a more serious view of his wild bid.

To his distress, he was kept dangling for an hour or two and then let off the hook with a lecture. The government people agreed that there was little chance of a wrong bid coming from Mr. Carter again.

Fantastic? Yes, but not uncommon. Every week Federal, State and private industrial agencies get similar bids on all types of items from all types of organizations — constant proof that businesses don't fail but human beings do.

The ridiculous bid is a source of annoyance for many reasons. Where a man is stuck with an order on which he negligently estimated his heart isn't in the work. He will constantly seek short-cuts to reduce his loss and the odds are that if a law suit doesn't result at least there will be a bitter taste in everyone's mouth. In addition, no buyer ever



"... no buyer wants to see a vendor go out of business . . . anyone can make a mistake."

wants to see a vendor go out of business both because of the knowledge that anyone can make a mistake including the buyer and the fear of litigation and complications involved in getting another source, reclaiming work in process, and so on.

Why do such bids come in? Well, there are many causes such as out-and-out disregard for the specifications; i.e., the theory that one should get the order first and worry about the job later. Then there are those who reach a point of desperation where, rather than lay off key people, they will take a job at a loss.

But the primary reason is the failure to go over each and every facet of every requirement before putting in the bid. It happens in all phases of industry. A man may bid on a simple looking part only to find that he forgot to notice whether or not a shaft had to be concentric. Another may overlook the fact that it is a tougher material to work on than he is used to and as a result his machine time and spoilage may go up 25 per cent.

This failure to follow the specifications does not necessarily mean that the bidder is trying to get into a new line of work. The same problem exists in rebidding an item.

Take, for example, the case of the company that originally designed and developed several servo components. After handling many production orders they took the contract awards for granted when the invitations to bid arrived. Suddenly, however, they lost several bids and sent a contingent to Washington to find out "what kind of monkey business" was going on.

When they reviewed the bidding



"... having the finest machinists and the most brilliant engineers ... does not mean success if there isn't adequate administration."

they quickly saw there had been some reductions in the quality control requirements and that their failure to notice put them considerably higher than the winning bidder.

And past practice can kill, too. Government agencies or manufacturers will send out invitations to bid which will clearly show every single thing that the vendor will be required to do. The vendor will send in his bid, get the contract and then, during the course of production when asked why he isn't performing certain tests which are clearly spelled out, will say, "Oh we never do those for our other customers." He will go on saying that until one customer makes it stick. Then to everyone he meets he says that that is one terrible outfit for which to do business. He will even show the customer contracts with others which called for the same tests and show that he didn't do them then.

Actually all he had to do was note in his bid that he didn't have the facilities or the know-how to perform certain items. Instead, how-

"Most of the time there is no opportunity to withdraw the bid."

ever, he would rather risk bankruptcy than the loss of the order.

What does it all mean? Well, briefly it means that having the finest machinists and the most brilliant engineers does not mean success if there isn't adequate administration. It means that a review of the specifications, item by item against the bid about to be sent, must be made on every order from the description of the item to the last nail in the packing case.

The numbers of people are legion who have put in infinitesimal bids on nuts, bolts or washers only to find that they must be individually wrapped in foil-lined containers. The specification only referred to a packing specification number and they thought that they would be packaged in huge quantities.

Most of the time there is no opportunity to withdraw the bid. When that is the situation you can't grin but you have to bear it.



"... it does mean that if the buyer wanted more he would have so designed it ..."

One Government source estimates that throughout industry well over \$100,000,000.00 a year is lost through careless bidding. The actual figure of course can never be known because many a manufacturer will swallow the bitter pill without a cry and make certain that it doesn't happen again.

How is this to be done? Well, by attention to detail without exception. That is to say, a check list should be made of every specification listed in the invitation to bid. Each specification so enumerated should be checked to see if it is the same issue as that in the possession of the bidder. If it isn't the same issue or the bidder does not have a copy, then one should be procured and carefully examined.

Where purchased or "off the shelf" items are involved, confirmation should be obtained from the supplier that the item he will furnish is exactly the same as the one on the assembly undergoing review. The supplier's quotation should be firm for 60 to 90 days.

In the case of machining, the hardness of material should be reviewed to make certain that there is nothing out of the ordinary. Parts that will be cast should be carefully examined to determine whether or not they have any characteristics which may result in an extraordinary amount of spoilage due to difficulties in casting. If any casting X-ray will be required and outside facilities will be used, the time and

cost should be covered by a quotation from the X-ray laboratory.

Lastly, it should be remembered that most specifications are drawn up far tighter than the normal use of the item requires. This does not mean that it can be taken for granted that the buyer will accept something less than the specifications. *But it does mean that if the buyer wanted more he would have so designated it.* Therefore, it is necessary

to bid on what the buyer wants and not on what it might be nice for him to have. There is no need to gild the price by needlessly attempting to gild somebody else's lily. If the buyer wants two coats of paint on a part and your custom is six hand rubbed coats, quote on two and give him two. The easiest way to business harmony is to give the buyer what he is paying for and to make sure he is going to pay for all he gets.

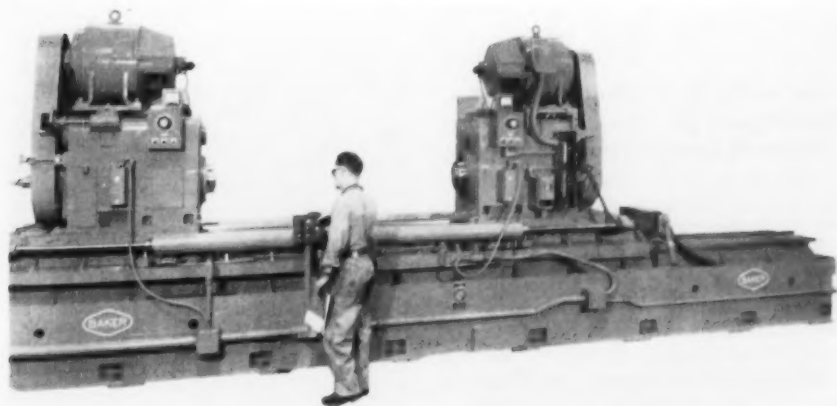
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Two-Way Machine for Drilling, Boring and Trepanning

Variable speeds at constant horsepower and the ability to handle pieces of from 6 to 60 inches for drilling, boring and trepanning are features of the machine illustrated herewith which was manufactured by Baker Brothers, Inc., Toledo, Ohio, for the El Segundo, California, Division of Douglas Aircraft Company, Inc. A two-way horizontal machine, one end can be adjusted on

a rack and pinion to accommodate varying lengths of work. The two 25-horsepower motors are variable from 50 to 1700 r.p.m. with full horsepower being maintained through back gearing. In high range, the sheave drive is direct to the spindle and in low range through the back gears. Both units have a 40-inch length of stroke and both are equipped with lathe-type spindles to permit chucking of a part for rotation or chucking of tools for rotation. When used for trepanning, both work and tool rotate.

For more data circle 2 on Reader Service Card





Welding Paper Abstracts

Abstracts of several of the papers to be given at the National Spring Meeting of American Welding Society, June 7-10 in Kansas City, Mo., are presented herewith.

Flash Welding of Commercial Molybdenum

By Ernest F. Nippes and Winston Chang
Rensselaer Polytechnic Institute

The bend ductility of arc-cast molybdenum flash welds depends on oxidation, weldment fibering, carbide precipitation, porosity, and grain-coarsening of the weld zone, and is therefore critically influenced by platen acceleration, amount of upset, and welding atmosphere. Under moderate amounts of upset and moderate platen acceleration, welds made in air exhibit acceptable ductility whereas the ductility of the welds made in argon or hydrogen is always low regardless of the upsetting conditions.

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Semi-Automatic Multiple Flame Brazing Larger Brass Electronic Components

By J. W. Weyers
General Electric Co., Welding Section,
Materials & Processes Laboratory

Excessive factory rejects on larger brass electronic assemblies were experienced with hand torch brazing. A mechanized method had to be selected to improve quality. Methods investigated included: induction heating, salt bath brazing, furnace brazing, inert arc

hand welding, inert gas metal arc welding and gas burner heating. The gas burner method was studied to determine variables such as: type of gas to use, combustion mixture, cost of gas, type of burner nozzles, direction and distance of flame impingement, hold fixtures, and so on. After selecting the method to use, the proper braceable material was specified, as well as joint design and clearance and brazing filler metal.

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Welding of Plate Girder Bridge By Submerged Arc Welding

By Joseph H. Hoffman
Bethlehem Steel Co., Shipbuilding Div.

This paper describes the method of fabricating 123-foot welded plate girder bridge spans starting with the burning to size of the plates, the jigs used for fitting and welding, the welding procedure using the tandem submerged arc welding process, shop changes to welding machine carriage to suit welding conditions and loading for shipment. The details bring out the reasons for using the described jigs and fixtures, the difficulties encountered by welding distortion and how they were overcome and why the tandem submerged arc welding process was used instead of others.

Temper-Brittleness of 1-Cr 1/2-Mo Weldmetal

By W. J. Lester and G. R. Prescott
C. F. Braun & Co.

In April 1953, weld-failures occurred in a 1-Cr 1/2-Mo catalytic-cracking reactor. This reactor had been in refinery-service for one year. Investigation of the failures indicated that the 1-Cr 1/2-Mo weldmetal had become embrittled under the operating conditions. Weldmetal taken from the reactor after seventeen days in service at about 965 deg. F. showed a significant decrease in impact strength.

Laboratory tests were carried out using the same weldrod as used on the reactor. The results have lead to four conclusions. (1) The 1-Cr 1/2-Mo weldrod produces weldmetal that is susceptible to temper-brittleness. (2) The degree of embrittlement is determined by the amount of external restraint. (3) The embrittlement occurs within the operating temperature-range of the reactor. And, (4) an overaging treatment recovers the impact-strength of embrittled weldmetal.

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Evaluating the Iron Powder Coated Electrodes for Production Use

By D. B. Howard
ACF Industries, Inc.

Iron powder electrodes being considered by American manufacturers include the proposed iron powder Class E6024 electrode, containing an appreciable percentage of titania for E6012, and the E6027 electrode containing an appreciable percentage of iron oxide for E6020. Several electrodes of each class have been evaluated using the Filler Metal Specification for Mild Steel Arc-Welding Electrodes, ASTM A-233-48T or the proposed ASTM A-233-54T, as a base. Manufacturers'

claims are reviewed and a short tryout test is performed to ascertain whether or not the electrode being considered is suitable for the production welding of horizontal fillets. Bend tests, impact strengths, macro and micro results are discussed. Deposition rates and electrode speeds have been carefully checked in triplicate at acceptable amperage levels. The relation of speeds of iron power electrodes to conventional electrodes is presented. Interpass and inter-layer temperature control techniques and their effect upon elongation are covered. The positive effect contributed by extended room temperature aging or artificial aging upon elongation values is also shown.

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Static Tests of Arc Welded Aluminum Alloy Beams

By M. Holt and R. B. Matthiesen
Aluminum Co. of America

Simple beam tests were performed to obtain design information by comparing the performance of I-beams fabricated from aluminum alloys 5154, X5356, and 6061. These alloys are currently of prime importance for use in welded structural applications. The types of specimens tested included: (1) extruded beams with no welds, (2) extruded beams with transverse butt joints at the center, (3) beams fabricated from three plates by longitudinal fillet welds, (4) beams fabricated from three plates and with large concentrations of welding at the center of the specimen, and (5) composite beams having compression flanges of either 5154 or X5356 welded to 6061-T6 extruded T-sections.

The test results indicate that beams fabricated from tempered material (-H34 or -T6 tempers) are definitely stronger than beams fabricated from annealed material, all of the beams fabricated from tempered materials having ultimate strengths equal to at

welding paper abstracts . . .

least 90 per cent of those of the 6061-T6 extruded beams. Although difficulties were encountered in achieving complete fusion in the transverse butt welds at the junction of the flange and web, when complete fusion of the transverse butt joint was obtained the test results indicated that the strength of the beam was decreased only slightly by the transverse joint. No difficulties were encountered in fabricating the composite specimens, and their strengths were approximately equal to that of the 6061-T6 extruded beam. Strain readings were taken during one series of tests to determine beam yield loads and offset deflections corresponding to 0.2 per cent offset strain in the extreme fiber.

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Weld-Metal Flaw-Evaluation Studies

By R. S. Ryan and P. J. Rieppel
Battelle Memorial Institute

A testing apparatus and specimen have been devised and built to study the influence of various flaws in weld joints on the initiation of brittle fracture. The testing apparatus is a sphere, approximately 9 feet in diameter, made from $\frac{3}{4}$ -inch high-strength low-alloy steel with good notch toughness. The test specimen is a 24-inch diameter circular disc of ship-plate steel, which is welded into, and is part of, the wall of the sphere. The test disc has the same thickness and contour as the wall of the sphere and contains full-size welded butt joints in which various welded flaws of controlled size are located.

A major portion of the effort has been involved with determining what kind of, or combinations of, load is needed to simulate service conditions

in ships or large structures. The results indicate that static loading is the best way to evaluate flaws. The results of static-loading tests indicate it takes a large flaw and nominal yield stresses to initiate brittle fracture. However, several specimens have failed below nominal yield stress (i.e., 24,000 p.s.i.).

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Hardenability Evaluation of Welding Electrodes

By Leo M. West
Douglas Aircraft Co., Inc.

In the Aircraft Industry most weld assemblies involving hardenable steels are heat treated after the welding has been accomplished. In most cases it is desirable, after such thermal treatments, to have the strength of the weld deposit match the strength of the parent material. This report covers testing procedures and results of many tests for electrode deposit evaluation after heat treatment. It also includes a discussion of the proposed new MIL specification designed to cover this field.

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Inert-Gas Tungsten-Arc Welding of Piping

By Helmut Thielsch and C. S. Pulliam
Grinnell Co., Inc.

This paper discusses development of backing rings for pipe welding; early attempts to eliminate backing rings; use of ceramic backing rings and back-up fluxes; development of inert-gas tungsten-arc welding of pipe and tube materials of light and heavy wall thicknesses; consideration of various joint designs; effect of purging with and without internal inert-gas pressure; appearance of welds in chrome-moly and stainless-steel pipe and tube materials; development of solid insert welding rings; advantages of eccentric insertion;

elimination of tack welding; appearance of contour of root weld in piping; single pass welding of light wall tubing; effects of fit-up, dilution, restraint, etc.; advantages and applications of insert ring welding procedure; and control of weld-metal composition particularly in austenitic stainless steels for corrosive or high-temperature service.

★ ★ ★

Inert-Gas Consumable-Electrode Arc Welding of 4130 Steel

By Craig R. Sibley and D. R. Kelker
Air Reduction Sales Co.

A study has been made of the welding of 4130 steel by the inert-gas consumable-electrode process. Several electrode compositions were tested and the influence of electrode chemistry upon weldability and strength were observed. Mechanical properties of typical deposits in the as-welded and heat-treated condition are presented along with a discussion of preheating, magnetic arc-blow, and crack sensitivity. Fatigue test data on transverse specimens demonstrate the performance of weld joints subjected to cyclic loading. The use of the process is evaluated in several commercial applications.

★ ★ ★

Inert Gas Welding in the Aircraft Industry

By J. M. Thompson, Jr.
Convair

This paper discusses the inert gas welding of aluminum, magnesium, titanium and stainless steel aircraft parts. Applications of inert-gas-shielded arc welding and use of consumable electrodes especially in the field of titanium are presented. Various other applications of inert gases in the industry as well as uses for atomic hydrogen welding are mentioned.

Surfacing with Composite Tube Rod

By Russel P. Culbertson
Haynes Stellite Co.

To meet the demand of industry for materials suitable for automatic welding processes, the so-called composite tube rods were developed. This product consists of pre-blended metal powders contained in a continuously formed mild steel tube. This type material may be produced in the form of coils and cut lengths suitable for oxy-acetylene welding or when coated, amenable to metallic arc welding. It has been possible by use of this type rod to obtain deposit chemistries tailored for the application such as fortified stainless steel compositions compensated for metallic burn-out, low chromium-molybdenum-carbon alloys, high-chromium irons, and other complex compositions.

★ ★ ★

Investigation of Weld-Metal Cracking in High-Strength Steels

By R. P. Sopher and P. J. Rieppel
Battelle Memorial Institute
and A. J. Jacobs
Ohio State University

Special apparatus was developed to study the basic causes of cracking in high-strength weld-metals. Hot-tension properties of selected high-strength weld-metals were determined during cooling down from the molten state. The hot cracking resistance of those same steels were studied, not only in relation to composition variables but in relation to each other. Particular emphasis was placed on a quantitative study of carbon, sulfur, and phosphorus variations and rare earth additions in S.A.E. 43XX-type weld-metals.

The results indicate that increasing carbon, sulfur, and phosphorus contents have adverse effects on hot-tension properties and hot-cracking re-

welding paper abstracts . . .

sistance, whereas rare earth additions tend to improve these properties. Sulfur and phosphorus seem to be more detrimental than carbon. The promising possibility exists that high-carbon filler wires, low in residuals like sulfur and phosphorus, can be deposited under conditions of high restraint. This weld-metal can then be heat treated with the base plate to high strength levels for commercial applications.

A plausible explanation for hot cracking is suggested in terms of typical hot strength and ductility curves. This explanation receives support from the results of cracking tests.

A limited amount of light and electron-microscopic work was conducted on weld deposits and tested hot-tension specimens. A slight but definite association was shown to exist between the presence of intergranular eutectics in the tension specimens and poor hot ductility.

★ ★ ★

Properties and Characteristics of A Quenched and Tempered Steel For Pressure Vessel Construction

By W. D'Orville Doty
United States Steel Corp.

Eight welded cylindrical pressure vessels, 20 feet long and 4 feet in diameter, were refrigerated to sub-zero temperatures and tested to destruction. The vessels were made of half-inch-thick plates of a new high-yield-strength quenched and tempered alloy steel. This paper describes the properties and characteristics of the new steel.

In the laboratory research and development work on the steel, a large number of tests were conducted. The tests were designed to determine the tensile properties, the notch toughness,

the metallurgical characteristics, the welding characteristics, the gas cutting characteristics, and the fatigue properties of the steel. The test results show that this quenched and tempered steel is characterized by high-yield strength, superior toughness, and good weldability.

★ ★ ★

High Speed Welding of Light-Gage Material

By R. A. Kubli and T. McElrath
Linde Air Products Co.

This paper reviews recent progress in the field of high speed welding with the submerged melt and inert gas shielded arc processes. The economical and technical use is described with speed emphasis on the conditions which must be satisfied for optimum results. A number of specific applications are discussed in detail.

★ ★ ★

Static and Fatigue Behaviors of Spot-Welded Joints in Titanium

By W. H. Kearns, W. S. Hyler and D. C. Martin
Battelle Memorial Institute

A study of the spotwelding of titanium and titanium alloys was made to determine the behavior of six-spot weldments under fatigue loading and to compare the fatigue behavior of similar weldments in titanium, aluminum, and stainless steel. Commercially pure titanium sheet, commercial titanium — 7 per cent manganese alloy sheet, experimental unalloyed titanium sheet, and Type 321 stainless steel sheet, all of 0.040-inch thickness, were used. Static tension-shear and cross-tension tests were made on single-spot welds in the materials and the tension-to-shear ratios were calculated. For equal gages and spot spacing, six-spot joints in the stainless steel sheet were

slightly better in fatigue than similar joints in the titanium materials under similar loading conditions. The joints in the titanium materials were significantly better than similar joints in clad 24S-T and 75S-T aluminum alloys. (The data on the aluminum alloys were developed in previous work.) Under static tension-shear loading, the joints in the titanium materials were stronger than similar joints in the stainless steel and the aluminum alloys.

★ ★ ★

Electrode Activation for Inert-Gas-Shielded Arc Welding

By A. Lesnewich
Air Reduction Co., Research Labs.

The theory of cathode activation is developed. Its application to the electrode or weldment of the arc is discussed and the changes produced are explained. The techniques for producing activated electrodes are presented, and the expected uses of these wires are given.

★ ★ ★

Oscillographic Instruments in Spotwelding Quality Control and Maintenance

By Glenn C. Woodmancy
Boeing Airplane Co.

Quality control systems for resistance welding have one common factor and that is proper means for assuring dependable welding machine performance. Experience has shown that service of three-phase spotwelding machines cannot be effectively performed without either the cathode-ray oscilloscope or direct writing magnetic oscillograph. In most cases both are needed. Three-phase frequency converter welders are particularly suited to the use of the oscilloscope because they can be operated so that various signals recur at a high enough frequency to be read

on the oscilloscope. Once operating personnel becomes familiar with the correct signal patterns at various places in the welder they can diagnose malfunctions. This paper discusses timing calibration, timing synchronization, current control dial calibration, weld pressure calibration, pressure and current correlation, ignition balancing and timing control check-out.

★ ★ ★

Carbon-Dioxide-Shielded Consumable-Electrode Arc Welding

By G. R. Rothschild and H. C. Cook
Air Reduction Co.

The characteristics of carbon-dioxide-shielded arc welding are described. The relation between welding conditions and weld-metal chemistry is discussed as carbon dioxide chemically reacts with the electrode and the weld. Typical weld-metal and weld-joint mechanical properties also are presented.

In addition to the information developed in laboratory studies, experience has been obtained in commercial applications. Data about several of these applications are presented and include welding conditions, weld evaluation, and cost analysis.

★ ★ ★

Maintenance Welding and Cutting Operations on Radioactive Process Equipment

By E. B. LaVelle and J. M. Fox, Jr.
General Electric Co.

Types and kinds of radiation and methods of decontamination are briefly discussed. The paper points up the unique conditions encountered in welding maintenance of atomic installations. A need for remotely controlled apparatus is seen, as well as for more comfortable and practical welding clothing.



Fig. 1—Lanhyrol Thread Rolling Machine.

The production of most thread forms by means of the rolling process offers a number of advantages among which speed and cold working undoubtedly can be considered the most important. The cold working property along with accuracy, of course, is becoming increasingly important as the demand, for example, for threaded parts with high strength such as bolts and similar fasteners in high speed aircraft must be met.

A recent outstanding development in the thread rolling field—a two roll design machine designated as the Lanhyrol, Fig. 1—was recently introduced to the metalworking field by Landis Machine Company, Waynesboro, Pa. With suitable rolls, this new machine is designed to produce 3/16 to 3-inch diameter, left or right-hand threads of all types with the exception of square threads and threads of high taper.

The flexibility of the Lanhyrol is demonstrated through its ability to produce threads by four distinct methods of rolling as required by

New Machine Thread

Two-roll design principle is applicable to wide range of workpieces.

conditions of workpiece design or material hardness.

Infeed or Plunge Rolling, in which the moveable die is moved to and from the workpiece, is generally used where a thread length of 5 7/8 inch or less is required. Continuously threaded roll dies are used on both spindles. The workpiece is placed on the workrest, blade or work-holding fixture with the right-hand roll and its movable housing in a retracted position. The desired thread diameter is produced as the machine cycle advances the right-hand roll to a predetermined distance from the left-hand roll and workpieces. The rolls are maintained at the fixed center position required to produce the desired pitch diameter of the thread, as illustrated in Fig. 4. The workpieces are delivered from a hopper or magazine feeding mechanism to a revolving, cage type workrest that indexes the pieces into and away from the rolling position. Indexing is in a timed relation to correspond to the arrival of the blank section

Extends Rolling Process

of the segmental die at the rolling position. By this means, in direct proportion to the number of die segments, one, two or three workpieces are threaded for each revolution of the segmental die.

Continuous Rolling can also be used for high production threading of studs, $5\frac{7}{8}$ inches or less in length, requiring threads at one or both ends. Studs with threads at each end are rolled using two dies on each spindle, as indicated by Fig. 5. Threads of a different diameter and pitch as well as threads of the same diameter and pitch may be produced with a single pass through the machine.

Reciprocal Rolling is designed for producing coarse pitch threads on materials of relatively high hardness (38C Rockwell, maximum) such as worms, or helical gears. Continuously threaded roll dies are used. The right-hand roll unit is retracted for loading. Normally, the workpiece is placed in a manually operated center type or mandrel fixture. The right-hand roll is then advanced toward the left-hand roll under hydraulic pressure. This pressure is controlled so that full thread depth can not be reached in one revolution of the workpiece. During the rolling operation, as the right-hand roll slowly advances to the required

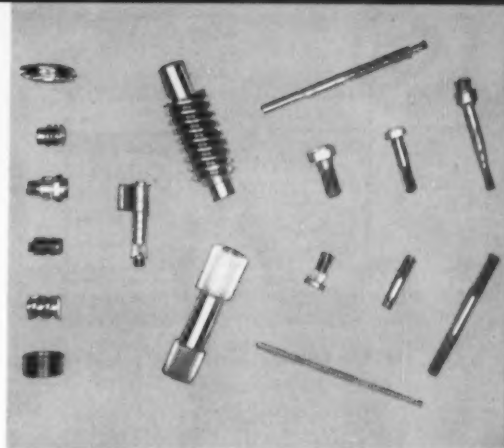


Illustration of typical thread rolled parts.

thread depth, the workpiece moves endwise because of the nut action between the rolls and the partially formed spindle unit which is mounted in stationary bearing supports (see Fig. 2). Automatic timing is provided during the period the right-hand roll unit advances, produces the thread and retracts. The dwell time for loading may be incorporated into the machine cycle for a completely automatic operation. Hopper or magazine feeding can be used with the automatic cycle if the total workpiece length is less than 7 inches. For semi-automatic operation the dwell time for loading is independent of the machine cycle as each cycle is initiated by the operator after the workpiece is placed in-to position.

With infeed rolling there is minimum endwise travel of the workpiece which enables close to the shoulder threading.

Thrufeed Rolling is necessary when producing threads longer than $5\frac{7}{8}$ inches. The workpiece is placed on

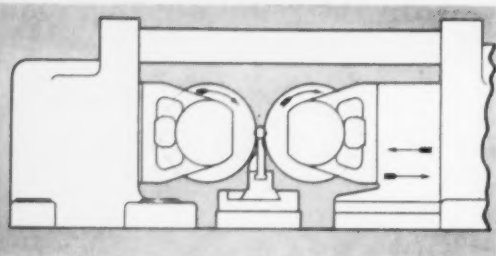


Fig. 2—Drawing illustrating Infeed Rolling.

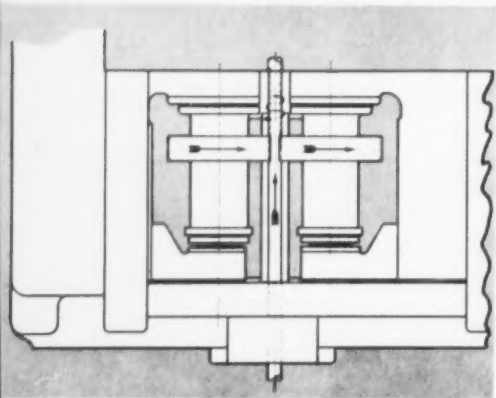


Fig. 3—Drawing illustrating Thrufeed Rolling.

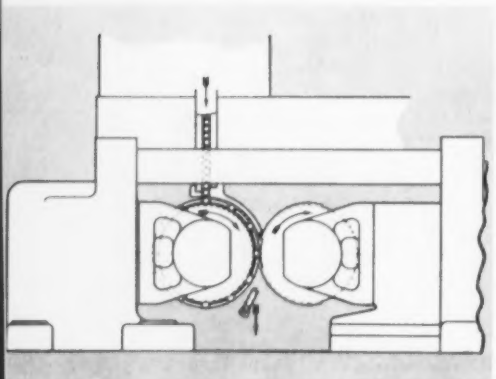


Fig. 4—Drawing showing Continuous Rolling.

the workrest blade and passes endwise between the rolls as the thread is formed (see Fig. 3). Continuously threaded roll dies with a throat section for progressive generation of the thread are provided. These rolls are maintained at the fixed center positions required to produce the desired pitch diameter of the thread. The right-hand roll housing does not cycle; however, it may be retracted for loading and unloading as desired by the operator.

Continuous Rolling provides the highest rates of production for headed workpieces $\frac{3}{4}$ inch or less in diameter with a maximum overall length of 7 inches, a maximum under the head length of 6 inches and of medium hardness. This method generally utilizes one continuously threaded roll die and one segmental roll die. Although, two segmental type dies may be used for certain classes of threads (see Fig. 6). To permit this endwise movement, the work-holding fixture operates in a slide. When the fixture has moved a predetermined distance, the direction of rotation of the rolls is reversed by the spindle rotation reversing lever and the workpiece and fixture return to their original position as they move endwise in the opposite direction (see Fig. 7). The cycle is repeated until the required thread depth is obtained.

The Lanhyrol Thread Rolling Machine is powered by a $7\frac{1}{2}$ constant horsepower two-speed motor with a vee-belt drive to the speed change gear box. Splined drive shafts and heavy duty universal joints connect the speed change gear unit with the final drive mechanism in the spindle housings. The final

drive to each of the roll spindles is accomplished through a heavy duty worm and worm wheel speed reducer that delivers power through a pair of helical gears.

The speed change gear unit provides sixteen spindle speeds, ranging from 14 to 126 r.p.m., through the use of four pairs of "pick off" change gears. Special gears can be furnished for higher and lower speeds when required.

Special heavy duty roller type bearings support the hardened alloy steel roll spindles. The inner sleeves of the bearings are fitted to a tapered section of the spindle to eliminate the radial clearance in the spindle bearings.

The hydraulic operating cylinder, which actuates the right-hand spindle housing, is machined from bar steel to insure high strength and maximum rigidity. Incorporated with the operating cylinder piston is a size adjusting screw and the housing stroke adjusting mechanism. The combining of these mechanisms into a single unit of "in line" design reduces deflections from the rolling forces to a minimum so that thread size can be uniformly maintained.

Variable hydraulic pressure is delivered to the operating cylinder which applies force between the rolls and the work through the action of its piston. When required, as in in-feed rolling, the spindle housing is returned to its rearward or loading position by tandem springs. The design of the operating cylinder unit eliminates over-loading of the dies and machine if oversize or improperly heat treated workpieces are accidentally presented to the equipment for rolling.

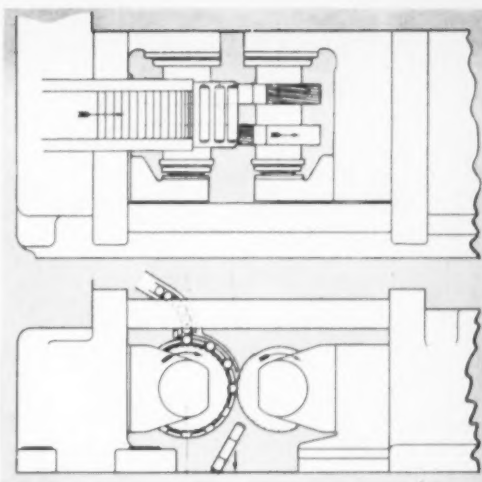


Fig. 5—Showing Continuous Rolling—studs.

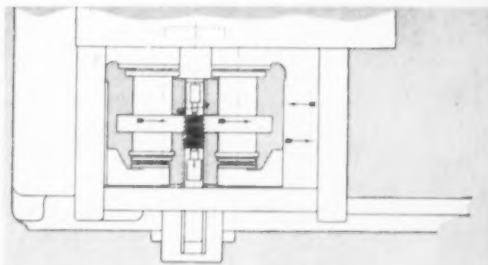


Fig. 6—Reciprocal Rolling—first operation.

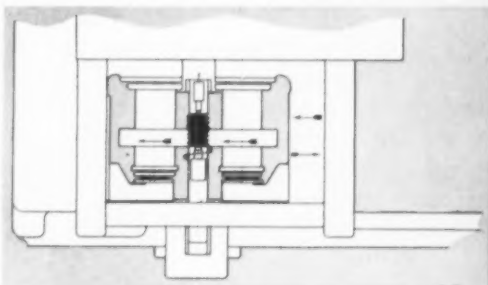


Fig. 7—Reciprocal Rolling—second operation.

Unusual Dust Collector Installation Conserves Plant Space

Mounting of dust collecting units on floors below grinding, finishing and polishing departments solves plant space problem at Yankee Tools.

By W. W. PETERSON

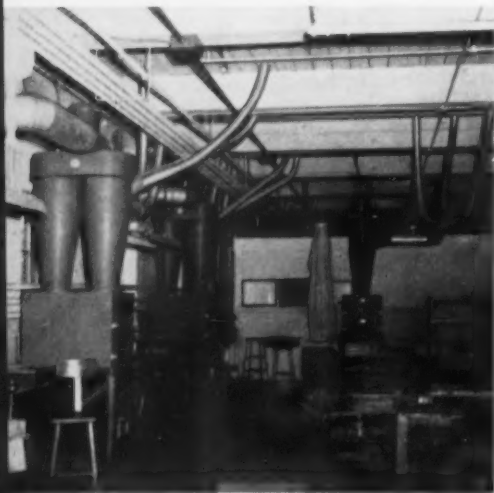
Plant Superintendent, Yankee Tools,
Division of Stanley Tools, Philadelphia

How to install ten dust collectors in a plant that apparently had no room for any was a problem that recently faced management at the

Philadelphia plant of Yankee Tools, Division of Stanley Tools, manufacturer of "Yankee" spiral screw drivers, push drills, vises, and so on. Collecting dust was not new at Yankee Tools. There had been two central systems in use for years, but these systems were obsolete and in need of replacement. The question was what type of system to install and where to put it. Space was at a premium in the grinding, finishing and polishing departments.

Another system similar to the old type would have worked out since the ducts could run overhead and somewhat out of the way; however, this meant using the entire collecting system all the time. Not all machines ran at once so it was decided individual units would work to greater advantage. But there was no room for adding these units. Production machines took up almost all available space.

Yankee Tools tossed the problem into the laps of Torit Manufactur-



This view shows three Torit No. 219 Cyclone dust collectors installed on the floor located below the grinding room at Yankee Tools.

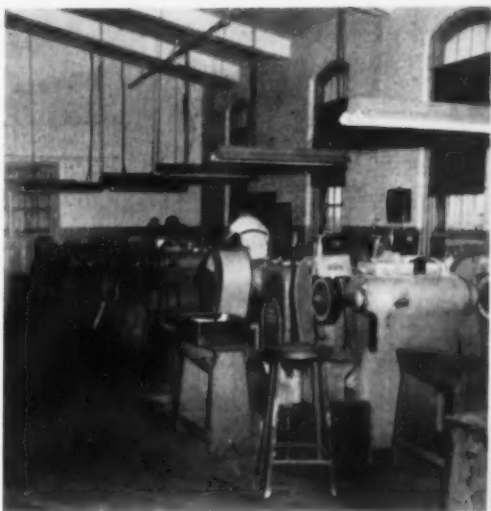
ing Company dust-collection specialists and engineers. They studied heating loads, the types of dust involved, the volume of dust created and other aspects of the problem . . . and gave special attention to the primary problem of conserving space. After carefully analyzing every angle of the problem, the engineers recommended installation of ten dust collectors throughout the plant.

But . . . where to put them? That was the next big question. The plant was so short on space that there was hardly room enough for one dust collector, to say nothing of ten.

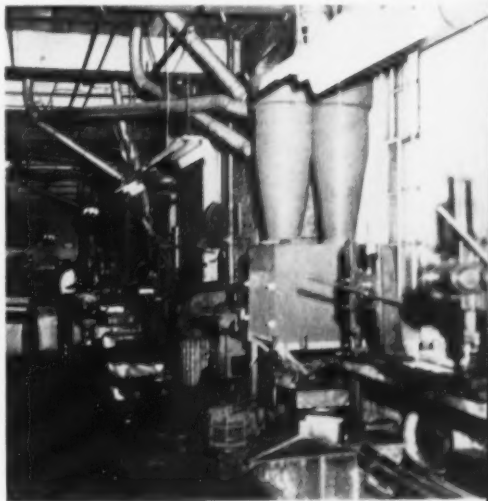
Engineers, in cooperation with plant management, solved the space problem by locating four of the collectors on the floor below the buffing and polishing rooms and connecting them through the floor to the buffing and polishing equipment. The other six collectors were installed on the floor below the grinding room. And here again, the duct went directly up through the floor to the grinding equipment.

The collectors chosen, Torit No. 219 Cyclone dust separators, can work to clear the air in the room above without actually being seen and with great efficiency.

"This unique method of installation gives our plant a wide-open, uncluttered look we're proud of," say plant officials at Yankee Tools. "The dust collectors are right there, doing their work, but only the hoods show. We find this a most satisfactory method of application. The several units are arranged to operate independently as required for production, giving a layout that is versatile and economical."



This illustration shows a view of the buffing and polishing department at the Philadelphia plant of Yankee Tools, Div. of Stanley Tools.



This view shows four Torit No. 219 Cyclone dust collectors installed on the floor situated below the buffing and polishing department.

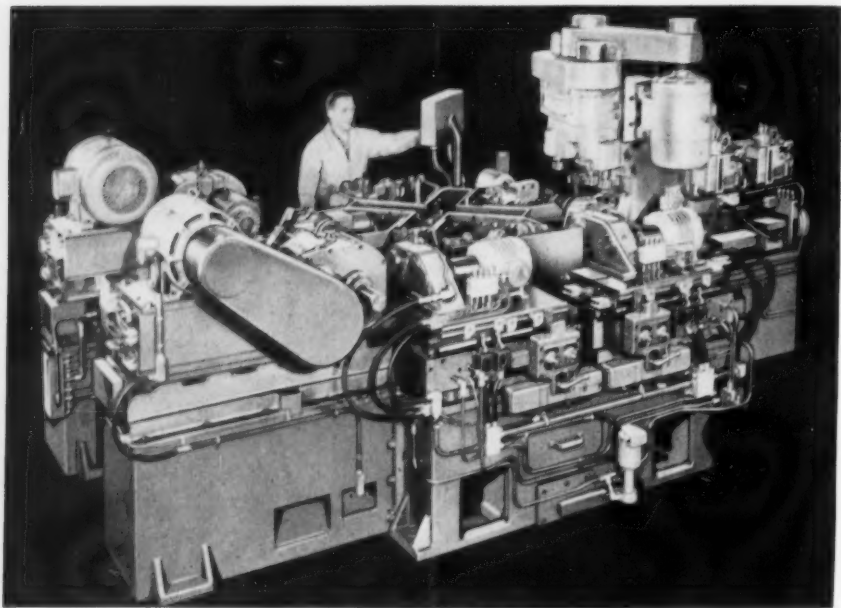
Automatic Crankshaft Machining



Newly developed four-station transfer machine automatically performs ten operations on crankshafts.

A recent advancement in transfer type production equipment has been made in the design and development of a rotary transfer machine which

incorporates features of both the straight-line transfer and rotary index type machines. This machine was designed by Kearney & Trecker



This illustration shows an overall view of the four-station rotary transfer machine especially designed for use by an automobile manufacturer in milling, drilling, and notching crankshafts.

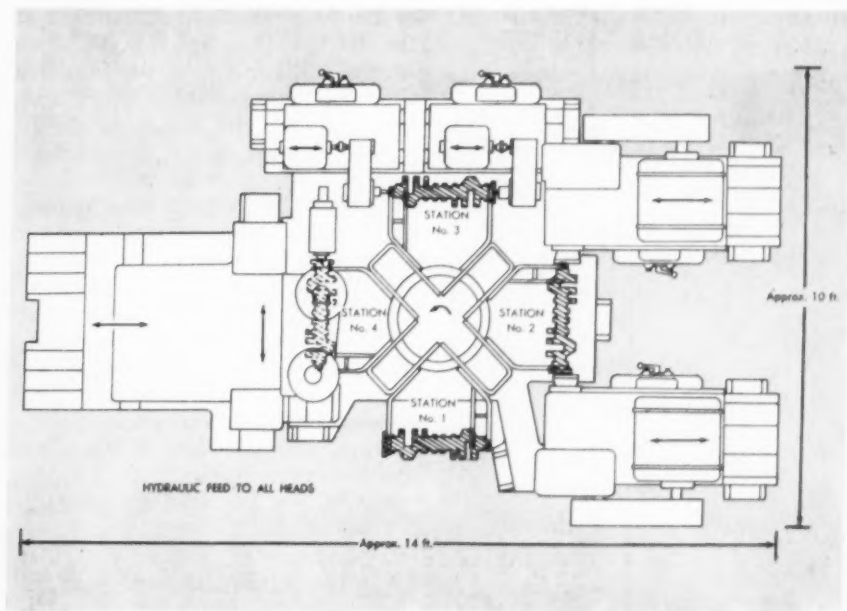
of Milwaukee for milling and centering operations on crankshafts for a Detroit automobile manufacturer. Specifically, the operations performed are milling both ends, centering both ends, and milling six locating notches in throws and counterweights for subsequent turning operations.

The machine is designed to transfer the workpiece rather than index the fixture, making possible the re-locating of the workpiece during the final notching operation. For the milling of the ends and the centering operation, the workpiece is located from rough forged surfaces. To maintain the required accuracy in milling the locating notches, it is necessary to locate the crankshaft

from centers for this particular operation.

Transferring is accomplished with an elevating and indexing carrier pivoting at the center of the fixture table. After all machining units retract and all fixtures unclamp, the carrier hydraulically elevates, lifting the workpieces out of their respective fixtures, rotates 90 degrees, and lowers to locate the workpieces in their next fixture according to progressive sequence.

The operation of the machine is completely automatic except for loading and unloading. Ten operations are completed at the rate of 108 pieces per hour. Hardened ways and standard feed slides are used throughout the machine.



Sequence of operations: Station 1—load and unload; Station 2—mill both ends of the crankshaft to length; Station 3—center drill both crankshaft ends; Station 4—mill locating notches.

Spline Honing Hardened Gears

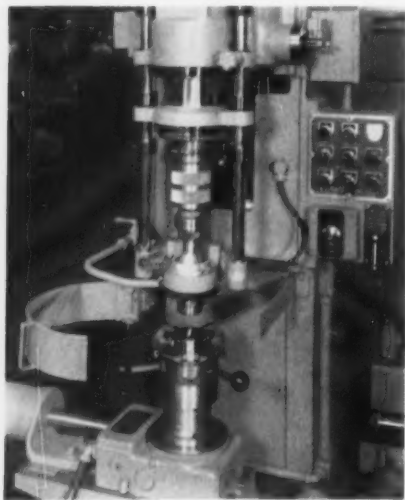
Gears are processed so that the bearing surfaces of the splines are generated concentric with the pitch of the teeth.

An interesting adaptation of the Model 728 Hydrohoner built by Micromatic Hone Corporation, 8100 Schoolcraft Ave., Detroit 4, Michigan, is where this model is used for a spline honing operation in which hardened gears are processed so that the bearing surfaces of the splines are generated concentric

with the pitch of the teeth, straight and round, and have a finish that will not pick up and gall the shaft. Previous to the adoption of honing, it had been necessary to anneal these surfaces before the final machining operation. The result was soft bearing surfaces; the character of the finish made it difficult to fit the shafts to the gears in 0.0002-inch increments because of the fact that the soft surface tended to pick up and gall the shaft.

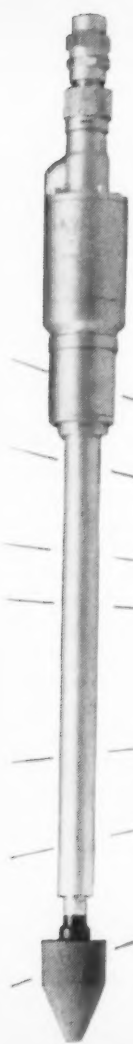
Microhoning solved this problem because surface hardness, it is claimed, does not affect spline honing. Instead, the problem was to obtain proper tool actuation in the confined area. This is particularly significant because, unless heat treatment is controlled very carefully, the hole may be out-of-round and tapered as much as 0.006 inch when it reaches the honing operation. To remove this amount of stock and correct inaccuracies, the cutting path of the abrasive grit must be varied and all stones dressed an equal amount.

In conventional honing jobs, this is accomplished by rotating the tool as it is reciprocated through the bore. To hone splines, tools are de-



This close-up view of the Model 728 Hydrohoner shows a hardened gear set up in proper position on the machine to allow for performance of the spline honing operation.

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signed with a stone for each spline — the stone about half as wide as the spline. Rotation is replaced by an oscillating motion. The stone is swept across the spline as the tool is reciprocated. To obtain full surface coverage by all the stones, the part is indexed periodically during the honing cycle.

In this operation, the Model 728 processes forged steel, 58 to 60 Rock-

well C hardness. It removes 0.002 to 0.006 inch of stock on the diameter, holding out-of-roundness and taper to less than 0.0003 inch. Finish is 15 to 20 micro-inches r.m.s. Size is held so that shafts can be fitted easily with 0.0002-inch minimum clearance. The machine has a cycle time of 35 to 40 seconds per gear and turns out 350 to 450 gears in an 8-hour shift.

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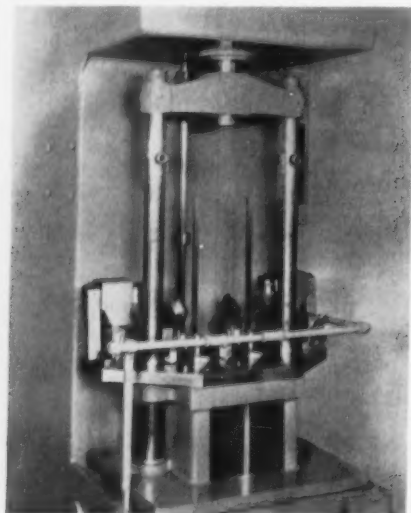
Broaching and Stamping Crankshaft Sprockets in One Machine Cycle

Two operations — one broaching and one stamping — are performed on crankshaft sprockets for a large

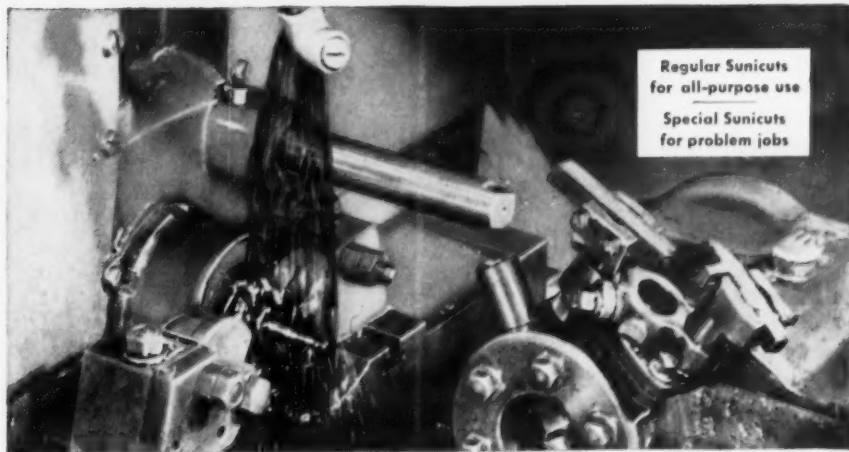
automobile manufacturer with the aid of a PB 6-24 utility press made by the Colonial Broach Company of Detroit, the press being equipped with a pull-down attachment and a special dual-function fixture which enable the machine to readily attain a production total of 280 parts per hour.

The two operations involve broaching internal keyways on two sprockets and stamping timing marks on the sprocket faces during one machine cycle. The two-station fixture has two locating horns. The sprockets are loaded on a ledge with the broaches in down position, after which the broaches are returned through the holes in the parts. The operator then shifts the parts to broaching position, and keyways are broached. Near the end of the stroke, pins on the guide ways engage cams on the stamping fixture, actuating the marking heads and causing them to strike the cam faces, leaving clear timing marks on the sprocket faces. The sprockets are then unloaded and the cycle is repeated.

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Colonial PB 6-24 utility press tooled to combine two operations — one broaching and one stamping — in a single setup. Output is 280 crankshaft sprockets per hour.



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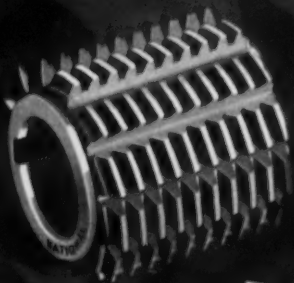
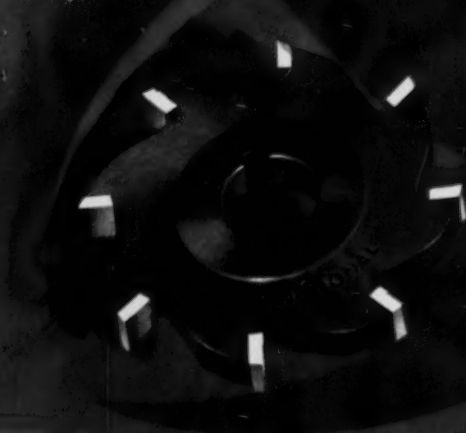


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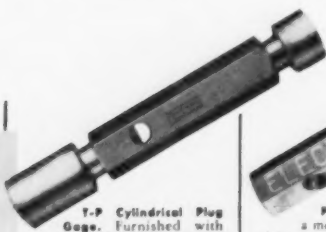


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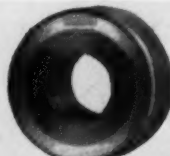
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T-P Truncated Thread Set Plug Gage. Sets and checks thread gages with greater accuracy. Checks thread angle and O.D. Indicates wear, or oversize.

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T-P Adjustable Thread Snaps. Faster than ring gaging, and just as accurate, they check lead, angle, and all other thread elements. Variable pitch diameter.



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For more data circle 362 on Reader Service Card

AT TIMKEN IT PAYS TO SPEED!



Incentive System Applied to Grinding Of Expensive Races

Well-engineered system at The Timken Roller Bearing Company encourages operators to work faster—but not so fast as to risk ruining \$1500 bearing parts.

Machine operators employed in the grinding of large expensive bearing races made from forgings were overly cautious for fear of scrapping the piece being ground. Grinding of such pieces, some of which are 72 inches in diameter, was consequently slow and costly. On the other hand, it would be ridiculous to demand high speed grinding of these pieces, for if even one were lost, the loss involved would be considerable. The problem was to establish an optimum grinding speed, and then an incentive system which would encourage the operators to work at that speed. Conversely it was desirable to discourage working speeds which were either in excess or less than the optimum. In other words, an incentive

system was necessary that would prescribe, within narrow limits, a safe yet profitable operating standard.

These forged, machined and heat treated bearing races are, by the time they reach The Timken Roller Bearing Company's industrial bearing grinding department, worth up to \$1500 each. The grinding operators, keenly aware of the value of these parts, were formerly over-cautious. Production was consequently less than it should have been. Furthermore, there had been insufficient incentive to encourage the grinding machine operator to use time to the best advantage.

Step number one in the solution of this problem was to establish a grinding practice that was safe—one

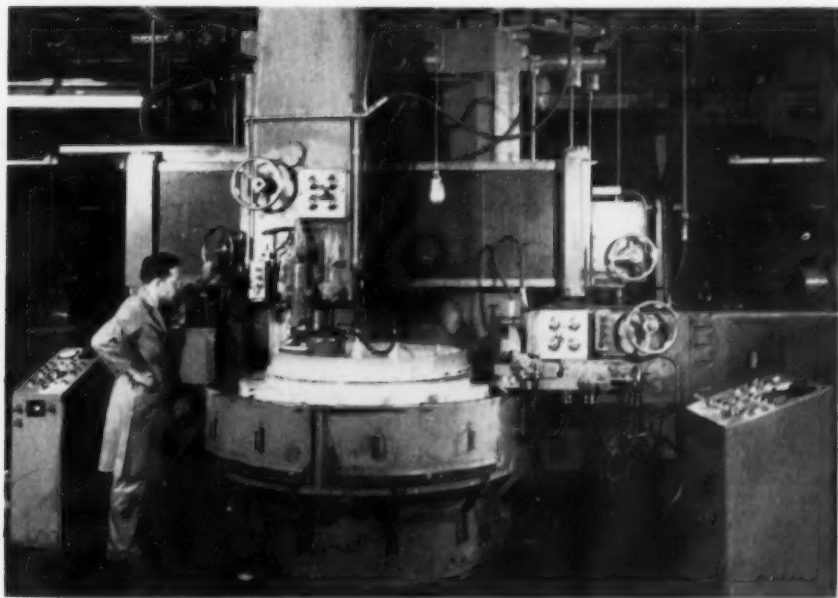
that would not cause the case hardened surface of the bearing race to be damaged. This was accomplished by measuring the pull or resistance placed on the motor of the grinding machine at the various grinding speeds. When the infeed or rate of stock removal was increased or diminished, the variation in load on the motor was shown on an electrical measuring instrument. The best grinding practice, with an ample safety margin, was accomplished when the resistance of the grinding wheel against the bearing race resulted in a pull, of a predetermined value, on the grinder motor.

It was next necessary to determine the time required to remove a given amount of stock at this grinding

speed. A careful time study of the operation determined the total time required to finish a given surface.

Each bearing part that now comes to the operator's machine carries with it a card specifying the grinding time necessary to properly finish the part. If the operator grinds the bearing part within a prescribed range of the time indicated, he receives maximum incentive pay. If the grinding time is less than or exceeds the prescribed time range, the maximum incentive rate is not paid.

Actual grinding time is recorded on a Chronolog attached to the grinding machine. When the grinding operation starts, a floor time keeper dials the Chronolog. This instrument also records the down time



Grinding expensive bearing race at Timken, where well-engineered incentive system enables operators to receive maximum incentive rate for grinding such parts within prescribed time.

**"... not one bearing part
lost to scrap pile . . ."**

due to lack of stock, absence of operator, changing pieces, personal reasons, minor adjustments, changing of grinding wheels, and machine repair. The performance of each operator and each machine is thus accurately recorded.

Results of this incentive system, since its inception at The Timken Roller Bearing Company, have been decidedly satisfactory. Extreme hesitancy, over-caution on the part of the operators, and fear of damaging valuable bearing races have been replaced by confidence. Production, as

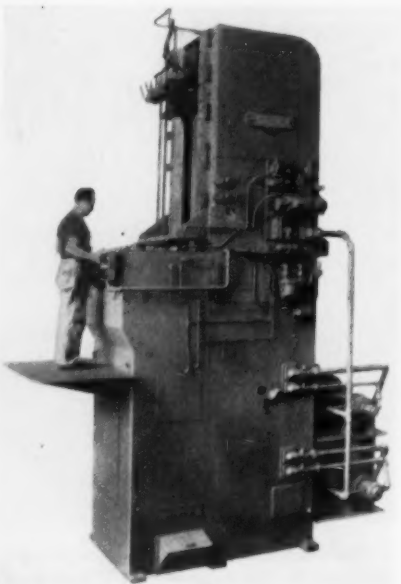
a result, has substantially increased. What was formerly accomplished only by years of experience, skill and judgment, is now being accomplished by accurate measurement. With the increased production has also come a commensurate increase in the operator's pay. Timken Company engineers are convinced that maximum production is now being achieved without jeopardizing the quality of these bearing races. That care and quality has not in any way been sacrificed for a material increase in quantity is evident in the fact that not one bearing part has been lost to the scrap pile as a result of the grinding operation since the new incentive system was inaugurated at Timken.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Huge Broaching Machine for Sleeve Yoke Parts

Believed to be the largest broaching machine (in tonnage) that has been made, the American 60-ton 72-inch stroke hydraulic pull down machine illustrated herewith is used to broach the internal spline and size the hole in over 30 different sleeve yoke parts. Two 40 h.p. motors provide the power for the broaching stroke and fixture operation. The machine is equipped with four broaching stations with manual control levers on the special broach pull heads which allow the operator to quickly disengage the broach when tooling change-over is made. Tooling includes a shuttle mechanism which automatically transfers parts into broaching position and then retracts, allowing the operator to load.

For more data circle 4 on Reader Service Card

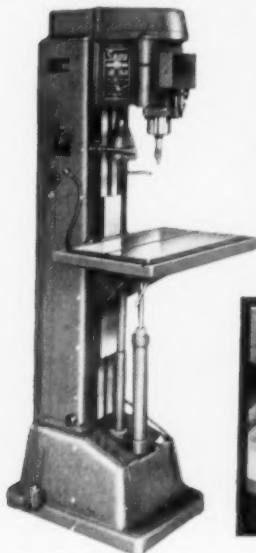


Quicker changeover, lower tooling costs...

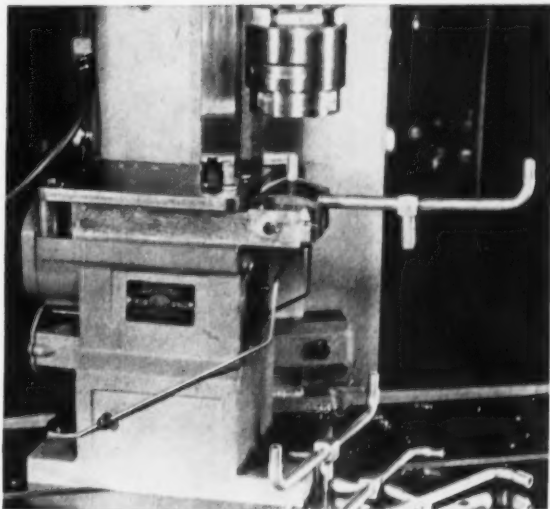
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Basic Master Fixtures for DRILLING, THREADING or TAPPING. Snow universal machines are the most flexible, most efficient, and most economical known. They save countless dollars in change-over time — help you start jobs sooner — assure quality at high production rates.

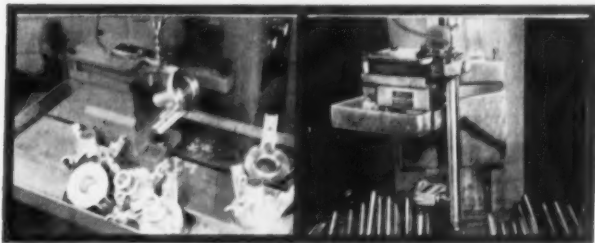
The square footage under a Snow Machine in your factory can be the most profitable in your whole plant. Submit details of your requirements.



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AIR CONTROLLED
AUTOMATIC OR
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AIR VISE holds part firmly — self-centering — always in exact position for precision work. U-shaped wire underneath provides quick finger-tip control, automatically starting spindle cycle. Jaw inserts keep tooling costs at minimum. Blank jaws always in stock — can be tooled to fit your part promptly, inexpensively.



Irregularly shaped parts are easily handled. Front feed permits close setting of guide plate for greater accuracy with high production.

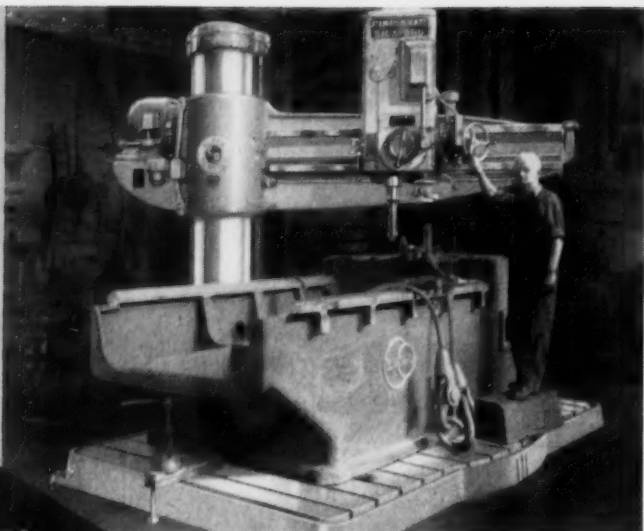
Here a short AIR VISE mounted on an offset table holds long tubing. Piece part switch under table automatically closes vise and starts tapping operation.

SNOW MANUFACTURING CO., BELLWOOD, ILL.

(Suburb of Chicago)

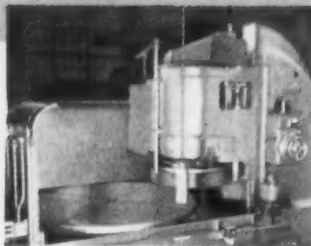
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**45
years of
experience
speaks**



"Well, if you don't buy a Cincinnati Bickford let me keep the one I have."

EMILE SACQUILLARD



A close-up of 42-7284 Blanchard Surface Grinder.

Photos courtesy of the Blanchard Machine Company, Cambridge 39, Mass.

Extreme accuracy is required in drilling 12 holes in base of large Blanchard Surface Grinders.

Three of these holes are for 3" x 18" studs, which provide column adjustment, to required flatness accuracy of .0002" on an 84" diameter magnetic chuck. The diameter of the three bores for the column studs are held to +.0005". Time on these operations was reduced an hour with the installation of this large Cincinnati Bickford Drilling Machine. This operator has not had an accident in 48 years of operating Cincinnati Bickford Super Service Radials. Twelve machines have been installed here, for their safety, production accuracy and general satisfaction.

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Overarm casting is rigid, boxlike structure; dovetail planed to perfect alignment with spindle.

Spindle and intermediate shafts jig bored for accurate alignment; mounted on over-size Timken bearings.

Heavy ribbed, box type, column casting assures rigidity.

Drive—5 HP 1750 RPM motor through multiple V-belt and dependable gear train; sliding gears in column are flame-hardened, mounted on spline shafts and are flooded with oil supplied by gear pumps with built in filter.



Husky arbor support has built-in oil reservoir, adjustable bronze bushing.

All sliding surfaces hand scraped to a bearing with mating member and with master gauges.

Line boring of table and saddle together after scraping assures proper alignment, provides free-running lead screw.

Knee is machine jig bored for accurate alignment. All units are indicator tested during assembly to meet established alignment for milling machines.

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- Rugged Greaves Mills are accurate and dependable, yet sell for thousands of dollars less than comparable machines.

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Resharpening Large Dies

High precision surface grinders having special length tables quickly resharpen large blanking dies.

In plants where large blanking dies are used in quantity, resharpening time can become excessive unless proper die sharpening facilities are available. Grinders having horizontal spindles and peripheral wheel action have been found particularly well suited for use in resharpening large dies with the result that Mattison Machine Works of Rockford, Illinois, has developed high precision surface grinders which are equipped with special length tables to handle such dies.

Usually, a surface grinder of this type is equipped with a long table for handling long workpieces if necessary; however, since many such grinders are installed particularly for die reconditioning service and, since a table 5 feet in length is adequate for practically any die encountered, a line of so-called die-block machines with 48 and 60-inch table lengths has been made available. All such machines have a 24-inch height capacity; however, either the 48 or 60-inch table is available in several widths, depending upon the range of die sizes to be handled in a given plant. These machines are recommended for reconditioning dies of all types. Their high power and abil-

ity to hog off stock allow die sharpening operations to be efficiently performed in a minimum of time.



A Mattison high precision surface grinder is shown herewith being used for the resharpening of a 45-inch diameter Near hardened steel lamination blanking die in the plant of the Allis-Chalmers Manufacturing Company.

Jones & Lamson dies are your best buy . . . whether you need Class III or not. They give you extra savings because of our system of "no approximation" . . . a factor that also applies to Class I and II.

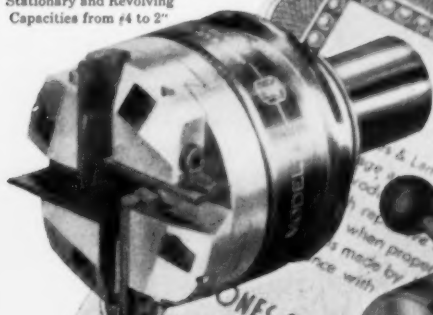
So, whatever your requirements,

Jones & Lamson's *written* Class III

or better Guarantee means

IMPORTANT SAVINGS regardless of tolerance requirements — NOT SOMETIMES... EVERY TIME!

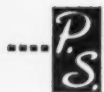
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Stationary and Revolving
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GUARANTEE
Jones & Lamson Thread Chasers come with a written guarantee for the life of the tool. When properly used in accordance with the instructions made by Jones & Lamson, the chaser will produce threads with a tolerance of .0001 inch.

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Springfield, Vt.

RADIAL CHASER TYPE
Capacities from
#8 to 4 1/4"



J & L die heads also offer: low initial cost, ease of operation, controlled resharping, use of carbide tipped chasers where applicable.



**FOR BROWN & SHARPE AUTOMATICS
and SMALL TURRET LATHES**
Capacities from #0 to 1 1/4"

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THREAD TOOL DIV.

For more data circle 366 on Reader Service Card

June, 1955

modern machine shop 151

Planing Boiler Plate

H-P-M Company reduces planing time on S.A.E. 1045 normalized boiler plate with carbide tooling.

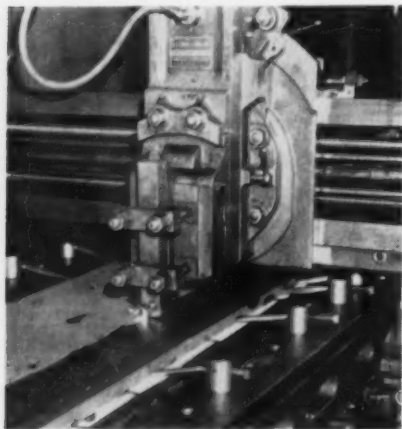
The time required for rough and finish planing S.A.E. 1045 normalized boiler plate was reduced to one-tenth the time previously necessary by changing to a standard heavy duty tungsten carbide round insert tool. This operation, currently being performed at the Hydraulic Press Manufacturing Co., Mt. Gilead, Ohio, consists of removing 7/16 inch of stock from both sides of 20-inch by 9-foot long step plates on a 35-horsepower double-housing Cincinnati Hypro planer.

Planing with the previously used tools required three to four passes per side and an average of three tool

regrinds for roughing and three for finishing to complete one piece. These tools were run at 1/16-inch feed on the first rough cut, 5/16-inch feed on the second rough cut, and 1/4-inch feed for the finish cut. All cuts were made at 30 surface feet per minute. Under these operating conditions, the time required for planing both sides ranged up to 11 hours.

With the Kennamatic Style 6RK95A tool (Kennametal grade K2S 1 1/4-inch diameter carbide insert) now used only two passes are required per side — a 3/8-inch deep rough cut and a 1/16-inch finish cut. Feed per stroke is 3/32 inch on roughing and 1/16 inch on finishing at 218 surface feet per minute — over seven times the speed practical with the previous tooling. As a result of this increased speed and greater depth of cut, planing time per piece is now only 45 minutes.

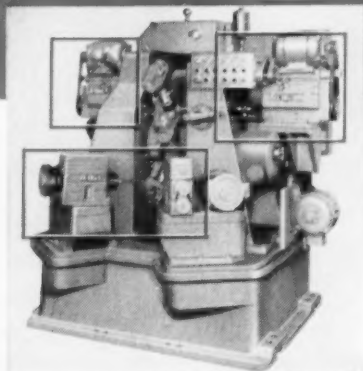
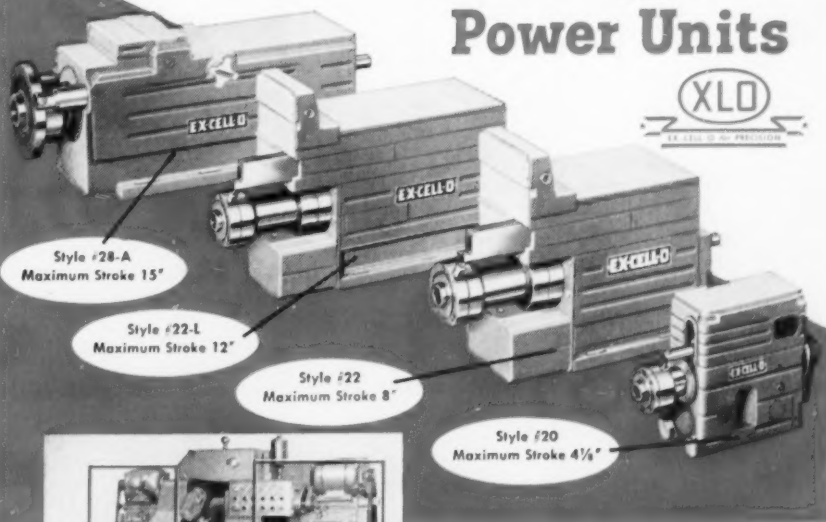
The 1 1/4-inch diameter carbide insert is indexed for operation; rough one side, then index insert to new cutting edge for finishing, index again for roughing other side, and so on. Thus, three plates are planed on both sides before any additional time-consuming regrinding is required. With this tool, machine down time is drastically reduced since the insert is easily indexed to a new cutting edge in seconds.



Rough and finish planing S.A.E. 1045 boiler plate with a Kennamatic vertically-clamped heavy duty tungsten carbide round insert tool.

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Ex-Cell-O Quill-Type Power Units



This special machine with automatic indexing fixture core-drills piston pin holes and drills angular oil holes. It uses six Ex-Cell-O Power Units (shown without belt guards) operated from a central push-button station.

Ex-Cell-O Hydraulic Power Units feed and rotate cutting tools in easily controlled automatic cycles. They actuate single tools or multiple spindle heads for such operations as drilling, reaming, counterboring and spot-facing. Hydraulic operation provides smooth, powerful movements.

A machine utilizing Ex-Cell-O Power Units can be very simple, with manual loading and clamping. Or it can be designed with work handling equipment for automation...

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**ARE YOU ENCOUNTERING DIFFICULTIES IN KEEPING STEELS
FROM BECOMING MIXED-UP IN YOUR SHOP?**

.....

Practical Methods of Steel Identification

***In this concluding installment, the author discusses
permanent magnet tests, spot tests and heat treating
tests as simple means of steel identification.***

By HOWARD E. BOYER

The value of the simple permanent magnet cannot be discounted in separating steels where the stainless varieties are likely to be encountered. It is well known that conventional carbon and alloy steels are ferromagnetic (attracted to a magnet). It seems to be a common supposition among many that all stainless steels are non-magnetic, which is far from true. The austenitic types, frequently referred to as the 18 and 8 types or those belonging to the AISI 300 series, are generally non-magnetic. Common members of this group are Types 302, 303, 304, 321, and so on. The AISI 400 types are completely magnetic, thus resembling conventional alloy steels in this respect.

Actually any statement regarding the non-magnetic properties of the AISI 300 series demands some qualification. These grades of stainless tend to become markedly magnetic when subjected to drastic cold work-

ing such as the drawing of Type 302 into wire products, thus precluding the magnet as a quick means of separation. An additional and easy operation can be employed to make this distinction. Simply take a small piece of the material and heat it by a torch or other suitable means to a bright yellow color and immerse it in water. If the material belongs to the 300 series of stainless it will be no longer attracted to the magnet. If it is still attracted by the forces of a magnet it is some material other than austenitic stainless.

The most reliable method for separating all grades of stainless from carbon or low alloy steels is the nitric acid spot test. This may be done by simply polishing a small spot on the material to be tested and making certain that the spot is free from grease. Next apply one drop of a fifty per cent nitric acid in water solution to this spot and observe. The drop of nitric acid will imme-

diately react with carbon and lower alloy steels leaving a brown stain, while no reaction will take place if the steel is any kind of stainless. The straight chromium types of the 400 series can be distinguished readily from the higher nickel-chromium types by the use of the magnet as already discussed.

There are other spot tests which have been used to an advantage in sorting steels, but in general these methods are best suited to use by experienced personnel in a laboratory. In too many instances most of these tests lead to controversy. One of the best known is the spot test for detecting the presence of nickel in steel. This is a simple test performed by first placing two or three drops of nitric acid on the clean surface and then, after allowing a few seconds for the attack to take

place, adding a few drops of dimethylglyoxime in alcohol to the acid. A red color indicates the presence of nickel and, by the use of suitable standards, one can become accomplished in determining the approximate percentage. This test is less valuable now compared to a few years ago due to the fact a greater percentage of the engineering steels contain at least some nickel. It is not uncommon to find up to 0.25 per cent nickel occurring as a residual where none is specified. Naturally this condition tends to confuse the test results. This test is mentioned for what it is worth, but other methods will usually produce results which are of more practical value in the shop.

Heat treating tests are not only valuable for obtaining data pertaining to the heat treating characteris-

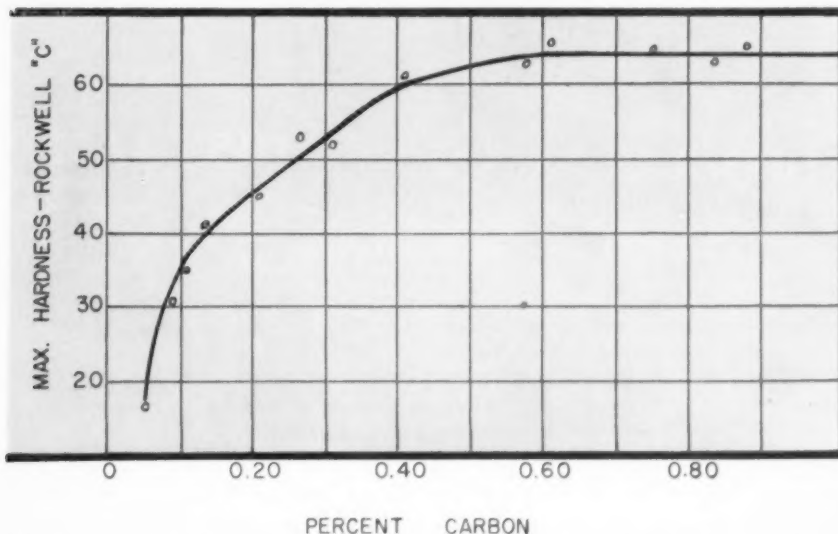


Fig. 3 — Chart showing how hardness is a function of carbon content. The curve plotted on the chart was determined by heat treating thin discs of known carbon content.

"... carbon content can be measured quite accurately ..."

tics, but when used in conjunction with other tests a store of data can be obtained. Most shops are in possession of at least some heat treating equipment which can be controlled within a reasonable

temperature range. For the simple heat treating tests which are discussed herein it is only necessary to have a small furnace which can be heated to about 1850 deg. F. for short periods of time. Apparently few people other than trained metallurgists realize that the carbon content of steels can be measured quite accurately within the range of 0.05

to about 0.65 per cent by the use of heat treating tests in conjunction with the ordinary Rockwell hardness test. Furthermore, the hardening capacity induced by alloying elements can be evaluated sufficiently for most practical purposes.

The degree of hardness which can be produced by heating and cooling steels is mainly a function of the carbon content plotted on the horizontal axis and hardness value in Rockwell "C" on the vertical axis. The curve shows the maximum hardness which can be obtained by heating and quenching steels

Pair of Profitmakers... these **SCHAUER** **SPEED LATHES**



Polishing conical brass adapter with Schauer Type NAO Speed Lathe.

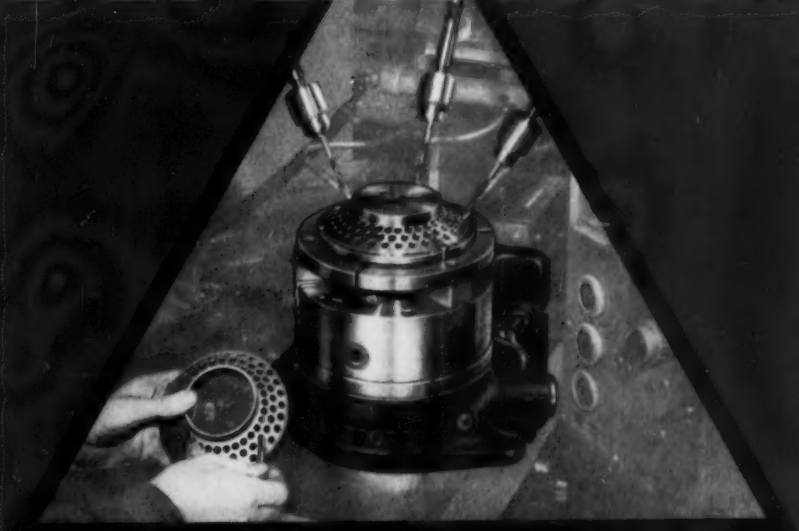
These versatile, low-cost machines handle an almost unlimited variety of work—deburring, lapping, filing, trimming, polishing, etc. Thousands in use, *profitably!* Many sizes and models with holding devices to suit the job. *Speed your production* with Schauer Speed Lathes. Write for Catalog No. 530.

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Bulletin S-103 gives complete details.

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"... percentage of alloying elements makes no difference."

of known carbon content. It may be surprising to many that a carbon content of only 0.20 per cent will produce a hardness value of "C" 45, for certainly it does not usually hold true in practice. The difference is that the specimens employed for obtaining the data shown in Figure 3 were only about 0.035 in. in thickness. Therefore, the cooling throughout such a thin section is almost instantaneous, thus realizing the full hardening power of the carbon that is present.

It naturally follows that if this method is employed to estimate carbon percentage the specimens must

be uniform and very thin; 0.030 to 0.040 in. is suggested. The size other than the thickness makes little or no difference; that is, whether the disc is from a one-half inch diameter bar or a four-inch round. With this type of test specimen the percentage of alloying elements makes essentially no difference.

Those who have consulted metallurgical texts may remember that the results shown in Fig. 3 compare closely to those published by Grossman over fifteen years ago. It will be noted in Fig. 3 that the curve becomes a straight line with a carbon percentage above 0.60 per cent. This is due to the fact that this is about the maximum amount taken into solid solution at normal heat treating temperatures. The spark test is

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(Hot and Cold Saws)

For Automatic Grinding of Cold Metal Saws.

Rigid — Accurate — Fast.

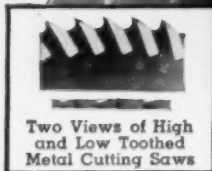
Ball Bearing Mounted Head Slides.

Heavy Duty Construction Throughout.

For inserted tooth, segmental type, solid tooth circular saws made in three sizes — Models 1130, 1160, 1172.

Saw capacities 8 to 72 inches and larger.

Other Models—Hot and Cold Saws, No. 12 and No. 572 (all sizes).



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MAIN OFFICE — Big Rapids, Michigan

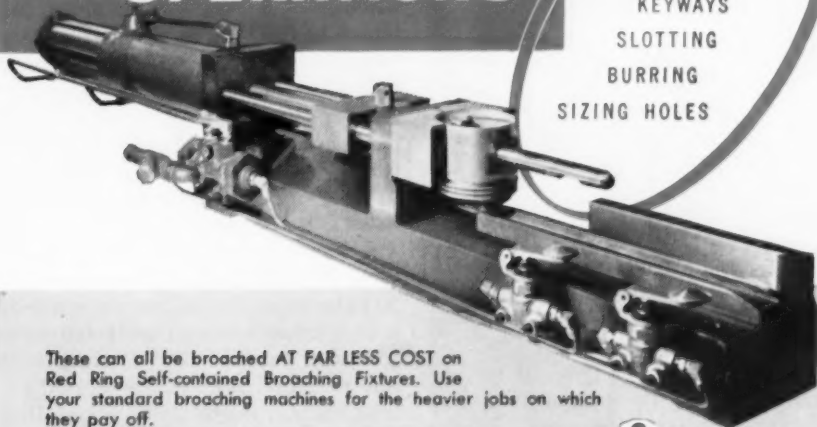
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OIL GROOVES
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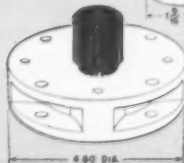
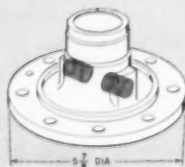


These can all be broached AT FAR LESS COST on Red Ring Self-contained Broaching Fixtures. Use your standard broaching machines for the heavier jobs on which they pay off.

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Call a Red Ring Broach Engineer or write for Bulletin B54-9 for more detailed information.



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GEAR SPECIALISTS
BROACHING OF ROTARY SHAVING
AND ELIPTICAL TOOTH FORM

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NATIONAL BROACH & MACHINE CO.

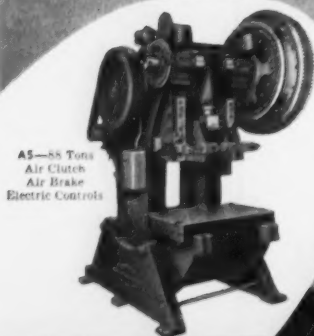
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WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

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**Backed by nearly
a half century of
dependable performance**

**... yet modern to the minute
for today's exacting demands.**



A5—88 Tons
Air Clutch
Air Brake
Electric Controls

- Engages smoothly; no sledge hammer blow.
- Inched, single stroke, or continuous.
- Less heat as brake is released when clutch is engaged.
- Less current used, brake is off when clutch is engaged.
- Clutch torque output in direct ratio to applied air pressure and controlled by regulator valve.
- Two run buttons, one stop button, one inch button operate on 110 volt regardless of motor current (220 or 440).
- No back lash when using air cushion or heavy spring pressure pads.
- Clutch is reversible. (By reversing wires on motor you can inch out of stall).

Robinson Presses are available (in either pin type or air clutch models) in sizes from 32 to 88 Ton.

ROBINSON
PRESSES

NEW ALBANY MACHINE MFG. CO.
NEW ALBANY, INDIANA

*Write for illustrated
brochure and
specification sheet.*

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**"... optimum heat treating
temperature depends on
carbon content."**

a supplementary means of estimation which will assist in establishing whether or not the steel is above the figure of 0.60 per cent. Fortunately most of our constructional carbon and alloy steels are below this figure in carbon content.

It is true that the optimum heat treating temperature is dependent upon the carbon content to a great extent; that is, the lower the carbon the higher the optimum temperature. If a spark test can be employed to gain some idea of the carbon content a reasonably suitable temperature can be selected, starting with about 1450 deg. F. for a 1.00 per cent carbon range up to about 1625 deg. F. for steel in the range of 0.15 to 0.20 per cent carbon. If no prior estimate can be gained there is little choice other than to use a temperature of about 1600 deg. F. as a constant. Relative results will still be obtained. Just take the unknown discs, heat them thoroughly and quench them in water. The scale must then be removed from the spot so as to facilitate an accurate hardness reading. The approximate carbon content may then read directly from the curve in accordance with the hardness value obtained.

Modification of the test described in the foregoing may be considered as a means of estimating carbon content as well as a method for estimating hardening capacity which is determined by other alloying elements. For this method of testing a much thicker specimen is employed;

More than meets the eye

P-K Socket Screws, at a glance, may look substantially like those you buy from "habit." You have to "look beyond the hex" for the difference.

If you don't, you are buying with a "blind spot" that can block your way to *proved* benefits other buyers are using to advantage. Parker-Kalon's exacting Quality Control is only one of the advantages you don't see until you "look beyond the hex."

Look Beyond the Hex

Compare every detail of product and service. Compare for advanced design . . . for proved assembly strength . . . for buying aids, and supply service. Get all the facts, and try P-K Socket Screws. You'll find they take top rating in any test.

Get samples, information from your P-K Distributor, or write: Parker-Kalon Division, General American Transportation Corporation, 200 Varick Street, New York 14, N. Y.



Two of the many steps in the exacting P-K Quality Control routine are illustrated. Left, the metallograph test to check metal structure, and right, the Magnaflex inspection, employing "block light" to reveal any defects.



FOR TOP QUALITY and tolerance gaged to your most exacting specifications — and guaranteed.



FOR ADVANCED DESIGN that speeds assemblies — makes them simpler, stronger — and saves errors.

FOR ASSEMBLY STRENGTH stayed in a million punishing tests by thousands of satisfied users.

FOR PLANNING AIDS and buying data patterned to your special needs, plus advice on assembly.

FOR SUPPLY SERVICE set up for fast action and lower purchasing expense — by local Distributors.

FOR ANY STYLE OR SIZE You'll find any Socket Screw you need in P-K's complete line. Hex Keys in all sizes, and several handy sets.

PARKER-KALON SOCKET SCREWS



GET ALL THESE ESSENTIALS OF COST-WISE ASSEMBLY
GET P-K

In Stock . . . see your nearby P-K Distributor . . . your local Supply and Service Specialist

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"... thickness should become standard for testing purposes."

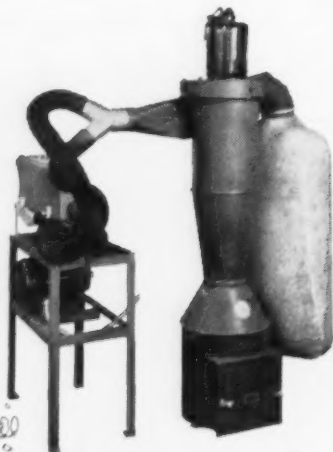
there is no established thickness, but one half inch is a suggested thickness which can serve most practical purposes. The specimen thickness is not extremely critical for this test, uniformity being the

important factor; that is, whatever thickness is selected should become standard, at least for most testing purposes.

In order to derive the most benefit from this test two test pieces of identical thickness are required. They may either be two identical discs or if the bar is large (more than one inch round) one disc may

be cut in half; it does not matter as long as the two are essentially the same in thickness. The next step is to heat the two samples in the same manner for the same length of time at some pre-established temperature. If no estimation could be gained by the spark test, and the simple tests have precluded the unknown from being any sort of stainless the best procedure is to heat them to 1600 deg. F. After the specimens have been heated, quench one in cold water and the other in a suitable quenching oil. Clean them off

TORIT DUST COLLECTORS



...Really draw!

A size and model to solve any dust collecting problem. Torit collectors provide complete, all-around dust control. Torit collectors are unitized for custom installation on each machine, giving power and suction only when machine is operating. Keeps plant and machines free from clogging and unsightly dust. Furthermore, cleaned and filtered air is exhausted back into the room maintaining heat balance. Find out now how Torit unitized dust control is engineered to your problems.

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TORIT

MANUFACTURING CO.

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Wilson "Tukon" Micro Hardness Testers



Model LR—Floor model
for Micro and
Macro Hardness testing



Model FB—Floor model
for Micro Hardness
testing only

Model MO—Table model for
Micro Hardness testing only

These "Tukon" models meet every fine test requirement

• WILSON "TUKON" Micro Hardness Testers are unexcelled for testing metallic and non-metallic parts where minute indentation and extreme accuracy are necessary. All use both Knoop and 136 degree Diamond Pyramid Indentor.

Selection of the model for your

requirement depends on the type and thickness of work to be tested, range of loads, other hardness testing equipment available and whether a combination of micro and macro hardness testing is required. Write for **Booklet DH-114** on WILSON "TUKON" Micro and Macro Hardness Testers.



Wilson Mechanical Instrument Division
AMERICAN CHAIN & CABLE

230-G Park Avenue, New York 17, N. Y.

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"... test requires practice to accurately evaluate the results ..."

so that hardness tests can be accurately made and test them carefully on the Rockwell "C" scale.

Now to interpret the results. If the water quenched specimen, for example, shows a hardness value of "C" 60 and the oil quenched sample shows a similar value, at least "C" 57 or more, it may be assumed that the steel is one of the medium carbon family (from the curve) and furthermore there is some appreciable percentage of alloying elements present. The latter conclusion can be drawn from the fact that the slower cooling power of the oil showed a value almost equal to water in

a one half inch section, thus proving that the unknown sample possessed considerable hardening capacity.

On the other hand if the oil quenched specimen showed non-uniform hardness value of "C" 40 or so it may be readily assumed that the steel is one of a straight carbon type — probably C-1045 or similar. In the instance of the two samples showing similar results the steel would most likely be one of the medium carbon alloys such as 4140 or 8640. In many cases it would not matter for most practical purposes as long as the performance characteristics in heat treatment are known. Naturally even this test is one which requires some practice to perform and accurately evaluate the results, but it can be used to a great

Beverly THROATLESS SHEAR
Cut any Shape... **STRAIGHT OR IRREGULAR**



B-3 with Ball Bearing Hold Down

Make any cut — curved, straight or irregular, faster, easier and better with less material waste on a Beverly Throatless Shear. You can turn work to any position and make a clean cut as you go. Handles heavy gauges with ease — lighter metals without distortion. 4 models—capacities 18 gauge to 3/16" mild. All shears equipped with High Carbon, High Chrome Blades.

INSIDE SLOTTED
8" Reach—16 ga. cap. Makes inside slotting cutting faster, easier, cleaner. Punch and die arrangement of 5 blades assures accuracy, clean cutting action. Cuts 2 1/2"x1/16" slot at one stroke. Throat design permits pivoting work at any point in stroke for special inside cuts. Note sample cuts at left.

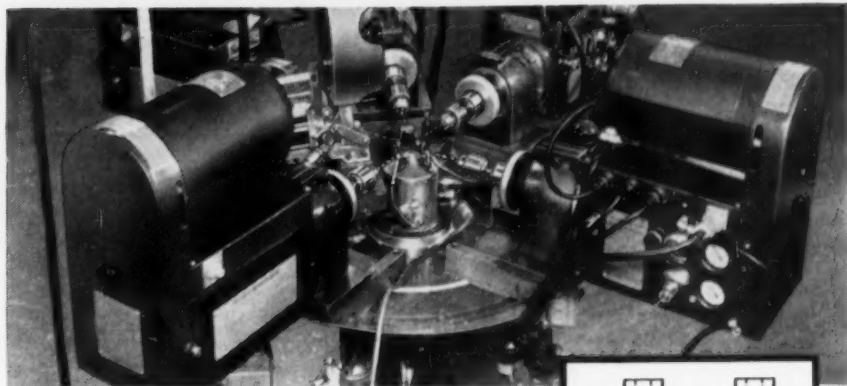
See your Beverly Dealer or write for illustrated catalog



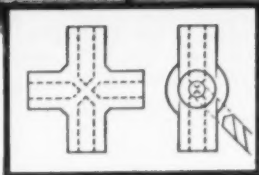
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Manufacturer saves \$26,000 using Dumore Automatic Drill Heads...



Drill Heads operate on two cycles . . . complete a workpiece every 25 seconds. Cycle I: Four heads advance, drill four 3/16" blind holes to 1 1/2" depth (see insert). Cycle II: Hydraulic-controlled head (top center) advances and drills hole at 150° to connect bottom of previous holes. Entire operation is automatic. Material is 5120 steel forging.



Saved \$26,000

On a job involving drilling multiple holes in an automotive part, the manufacturer originally planned on a \$34,000 single-purpose machine. At the suggestion of their Dumore distributor salesman, they investigated the possibility of using versatile Dumore Series 24 Drill Head Units. They found ten Dumore Drill units costing less than \$8,000 could handle the job.

Increased output 25%

Preliminary studies showed the company that the \$34,000 machine would produce 120 pieces per hour. Ten Dumore Series 24 Drill Heads complete 150 pieces hourly.

Got extra utility

When this job is finished, the manufacturer plans to use the Dumore drill units for other jobs. On the other hand, the originally planned \$34,000 single-purpose machine would, more than likely, be useless for subsequent applications.



If you'd like to know more about these sensational Dumore Drill units . . . how they can help you substantially reduce tooling costs, increase drilled hole output and improve product quality . . . contact the Dumore Distributor in your area or — write for the new Series 24 catalog.



DUMORE
PRECISION TOOLS

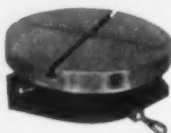
Builders of a precision line of Grinders, Automatic Drill Heads, Tool Post Grinders, Drill Grinders, Light Drilling Equipment, Flexible Shaft Tools, Hand Grinders, Fractional hp motors and Gear Motors.

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- Saves fixtures and time consuming setups.
- Saves time in circular positioning.



CAM LOCKING TYPE ROTARY TABLES

Three sizes: 12", 15", 18"

This model is intended for die sinking, bench work, and assembly of machine units when quick rotation and positioning are required.



STANDARD MODELS WORM WHEEL OPERATED ROTARY TABLES

Five sizes: 9", 12", 15", 21"

For die sinking, jig boring, cam milling. Indispensable in wood and metal pattern shops.



HEAVY DUTY MODELS WORM WHEEL OPERATED ROTARY TABLES

Three sizes: 18", 21", 25"

These larger, heavy duty models are used for jig work, planer jobs, and on horizontal boring mills.

DIVIDING ATTACHMENTS or DRILLING ATTACHMENTS can be furnished.

See Your Dealer or Write to us for Complete Catalogs.



TROYKE MFG. CO.

CINCINNATI 9, OHIO

For more data circle 390 on Reader Service Card

168 modern machine shop

"... data sheets are useful to test numerous samples."

advantage in shops where a large variety of steels is regularly processed.

Several means of simple testing have now been discussed in the foregoing. In some cases one of these tests might be sufficient to obtain the desired information, while in other cases two or even all of these tests may be necessary in order to obtain the necessary information. It must be emphasized that it is not always possible to obtain enough information so that such tests can be substituted for an analysis or a metallurgical examination, but usually if the data from such tests is carefully tabulated and interpreted, by someone who has at least a smattering of metallurgical knowledge, the unknown steels can be identified sufficiently for practical purposes. The careful use of such tests can be further extended for the purpose of quickly checking properties of incoming steels, thus exercising some appreciable degree of metallurgical control in the absence of laboratory facilities.

Some sorts of form data sheets are most useful when it is desirable to test numerous samples. An example of this type of sheet with several sets of test results tabulated is shown in Fig. 4. This particular form merely represents one example; modifications may be made to suit the specific situation. The important part is to have the results of these quick tests collected in an organized manner so that they may be studied

June, 1955

EVOLUTION of MULT-AU-MATIC PROGRESS

Since 1914 the Bullard Multi-Au-Matic has reflected engineering and design progress required to fulfill industry's needs — until today, the Type "L", is the optimum for machines of its type.

Here are some of its features...

CONTROL SYSTEM: Advanced design of electro-hydraulic controls provide a readily accessible and simple control system for both Set-Up and Automatic machine operation.

FEED MECHANISM: Completely new screw type feed works insures smooth constant rate of advance of tool slides through any desired part of a 16" stroke with 81 feed changes ranging from .0025 to .0625.

SELECTIVE SPINDLE SPEEDS: Range from 35 r.p.m. to 1,000 r.p.m. at each station providing the correct cutting speed to suit the specified operation.

CARRIER INDEX: The new indexing mechanism with improved carrier column bearing permits faster index of spindle carrier thereby reducing time between cuts. New design index mechanism registers and locks carrier, on successive indexes, to within $\pm .0005$.



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MULT-AU-MATIC TYPE "L"

Available in three sizes
10" with 6, 8, 12 or 18 spindles, 14" and 18" with 6 or 8 spindles.

THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT

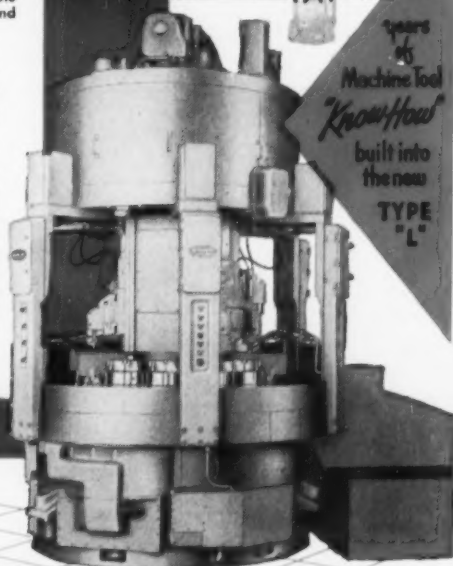
1914

1919

1930

1947

Years of
Machine Tool
"Know-How"
built into
the new
TYPE
"L"



For more data circle 381 on Reader Service Card

"By this method the type of steel usually becomes readily obvious."

more efficiently. By this method the type of steel usually becomes readily obvious.

The examples shown in Fig. 4 will be discussed briefly in the following paragraphs. For the moment let us assume that we have seven samples of unknown steel, varying in size, but otherwise they are random bars and they look essentially the same. First the samples should be numbered in some manner (one to seven in this case) with corresponding numbers on the bars. Make certain that the samples are clean.

Then start by performing the easier tests first. Taking Sample 1 it was easy to determine that it was magnetic and was attacked by nitric acid, which immediately eliminated it as any member of the stainless family. Since it showed a very low carbon by spark on the grinding wheel and an extremely high sulphur content by the print method it can be immediately assumed that this steel is B-1113 or some very similar grade.

Sample No. 2 was also found to be magnetic and vulnerable to the

| DATA SHEET STEEL IDENTIFICATION | | | | | | | |
|------------------------------------|----------------|----------|----------|------------------|---------------------------|---------------------------|--|
| SAMPLE | NITRIC ACID | MAGNETIC | SPARK | SULPHUR PRINT | HT. OIL | HT. WATER | PROBABLE MATERIAL |
| 1. | attacked | yes | very low | very high | ✓ | ✓ | B-1113 |
| 2. | attacked | yes | medium | medium | ✓ | ✓ | C-1141 |
| 3. | no | yes | alloy | very low | 1850°F C-42 | ✓ | 410 stainless |
| 4. | no | yes | alloy | medium | 1450°F C-43 | ✓ | 416 stainless |
| 5. | attacked | yes | medium | low | ½" disc 1550°F C-45 | ½" disc 1550°F C-60 | C-1045 |
| 6. | no | no | ✓ | ✓ | ✓ | ✓ | 300 series stainless |
| 7. | attacked | yes | high | very low | ½" disc 1550°F C-65 | ✓ | 52100 or low alloy tool steel |

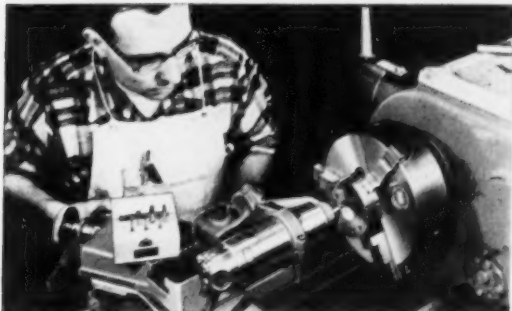
Fig. 4—Example of a workable method for tabulating test results for study and correlation in separating mixed steels; modifications may be made to suit the specific situation at hand.

Precise POWER QUILLS

**UP TO 45,000 R. P. M.
AND 1/2 H.P. ON AC/DC
FOR TOOLROOM AND PRODUCTION**

For speed with power with precision at real savings, mount PRECISE POWER QUILLS on lathes, milling machines, surface grinders—virtually *any* available single-purpose machining tool. In such applications as internal and external grinding or for micro-milling, precision straight milling, slotting, small diameter drilling, finishing and polishing, one PRECISE POWER QUILL with PRECISE MACHINE MOUNT can frequently do the work of a machine costing up to 100 times as much! Fine finishes to tolerances as close as .0001" are obtained with carbide micro-mills or high-speed grinding wheels in less time and at lower cost on materials as soft as plastics, as brittle as glass or as hard as the hardest alloy steel. A complete line of Mounts, Speed Controls, Accessories and Rotary Tools provide *unlimited versatility*.

CONDENSED SPECIFICATIONS: Choice of 1/4 or 1/2 H.P. Models in precision-ground steel housings. Air-cooled AC/DC motors, protected against overloads by replaceable Fusetrons; heavy-duty, direct-drive quill rides on four over-sized, sealed, micro-precision bearings. Ground and honed collet chuck uses collets in a range between .090" to .250".



Micro-milling hard steel die. PRECISE SUPER 50 removes as much as .005" in one pass leaving surface finishes under 10 micro-inches and producing a straight, round hole to .0001".



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Just Off the Press**

PRECISE PRODUCTS CORPORATION, 1345 CLARK ST., RACINE, WIS.

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TO BE SURE OF
QUALITY

Remember
the Name

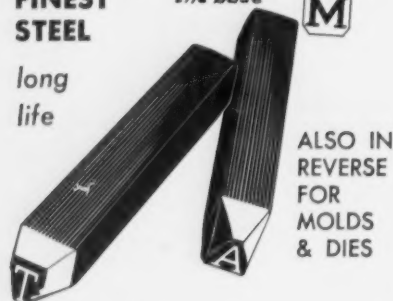
HOGGSON

**STEEL
STAMPS**



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STEEL**

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REVERSE
FOR
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& DIES

Letters and figures, deep-cut in hardened, special-formula steel, assure clean impressions and long service. Wide range of letter sizes. At your Mill Supply or write for circulars.

HOGGSON & PETTIS MFG. CO.

New Haven 7, Connecticut

For more data circle 383 on Reader Service Card

172 modern machine shop

**"A sulphur print showed
virtually no sulphur . . ."**

attack of nitric acid, but the spark test showed a pattern similar to the C-1045 in Fig. 1, so it would be estimated as a medium carbon steel. The sulphur print showed an appreciable amount of sulphur. These results certainly indicate that this steel is C-1141 or at least one very similar. Even C-1144 would show a markedly different sulphur print since it contains about the same amount of sulphur as B-1113.

Sample No. 3 was found resistant to nitric acid, but was attracted to the magnet which immediately identified it as one of the Type 400 stainless steels, but since there are several which vary considerably in composition, which one? Spark tests merely suggested that it was a high alloy material which could not be closely identified. A sulphur print showed virtually no sulphur; thus, it is excluded from being any free cutting grade such as 416. The final test is to heat the sample to about 1850 deg. F. and quench it in oil. Hardness after this treatment was found to be "C" 42 which established, within a reasonable degree of accuracy, that this steel is Type 410 stainless. It is true that Types 414 and 431 would react in a somewhat similar manner to these tests with the exception of the last. These other types will usually result in somewhat higher hardness (around "C" 45-47). Furthermore the difference between these grades of stainless is not great so that oftentimes they may be used interchangeably.

June, 1955

NEW FEED and CONTROL MECHANISM
increases production!

D225H MACHINE

AVAILABLE WITH

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- ✓ ADJUSTABLE SPINDLE HEAD
- ✓ FIXED CENTER SPINDLE HEAD



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*...for medium size work
new push button control reduces
costs by speeding operations*

POSSIBLE FEED CYCLES

1. STANDARD CYCLE—Rapid traverse forward, 1st or coarse feed forward, 2nd or fine feed forward, rapid reverse, stop.
2. JUMP FEED CYCLE—Additional Equipment. Rapid traverse forward, 1st or coarse feed forward, rapid traverse forward, 1st or coarse feed forward, 2nd or fine feed forward, rapid reverse, stop.
3. TIME DELAY REVERSE CYCLE—Additional Equipment. Rapid traverse forward, 1st or coarse feed forward, 2nd or fine feed forward, dwell against positive stop for pre-determined time, rapid reverse, stop.



Call a Natco Field Engineer

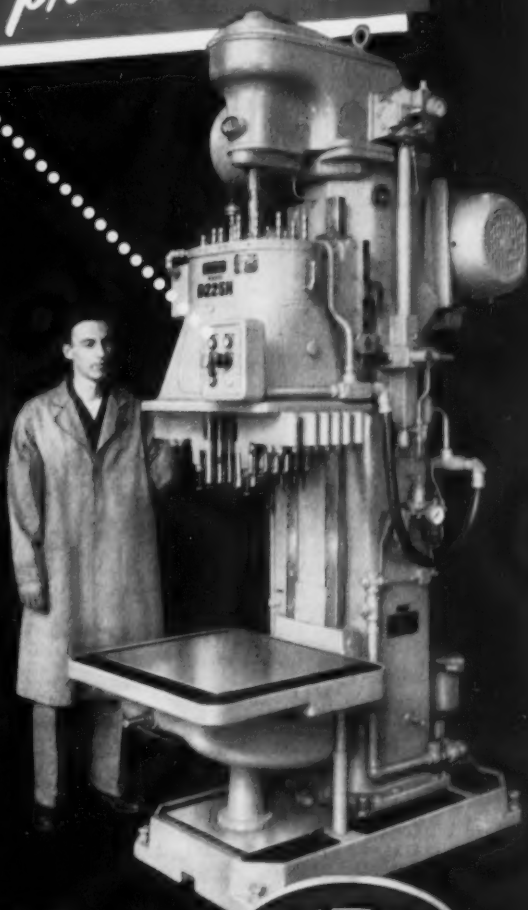
*to help you solve your problems in
Drilling, Boring, Facing and Tapping*



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"... information as to type usually requires an analysis ..."

It will be noted that Sample No. 4 showed exactly the same characteristics as No. 3 except for the sulphur estimation, thus easily establishing No. 4 as Type 416 stainless.

Sample No. 5 was found to be non-resistant to nitric acid and magnetic, but showed a medium carbon spark indication and a very low sulphur content by the print. Up to this point it could be either a plain carbon steel of the intermediate range or a low alloy type with a similar carbon content. This is easy to establish by heat treating two discs one half inch in thickness. The water quenched sample showed a

hardness value which might be expected for a steel of around 0.45 per cent carbon (referring to Fig. 3) but the specimen which was quenched in oil showed much lower hardness values. Therefore, the steel must be one of a nearly straight carbon type, C-1045 or similar.

Sample No. 6, from the fact that it was non-magnetic and resistant to nitric acid, is quickly identified as one of the 300 Stainless type family. Oftentimes this much identification is sufficient, but further information as to just which type usually requires an analysis or at least a more elaborate examination.

The last sample, No. 7, was easily determined to be a high carbon, low sulphur steel and since a one half inch thick disc showed a hardness of "C" 65 after oil quenching from

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- Removing burrs, carbon, rust, grime, paint, etc.
- Stenciling letters, designs, trademarks, etc.

Leiman Sandblasts provide the fast, low-cost, safe, uniform way to perform the operations listed above . . . whether mass production or single pieces, large or small. Easily operated by unskilled help. Well-designed, rugged, last for years, priced right.

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FEATURES:

- Continuous vacuum abrasive feed
- Heavy gauge welded steel cabinet
- Doors at each end
- Two arm holes with rubber gloves
- Two interior lights
- Foot pedal control
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- Use all abrasives

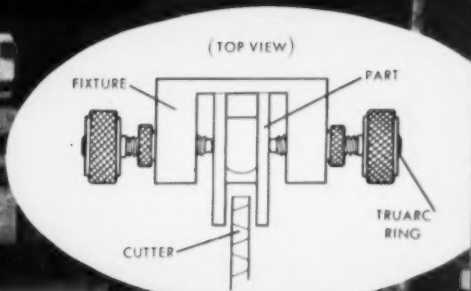
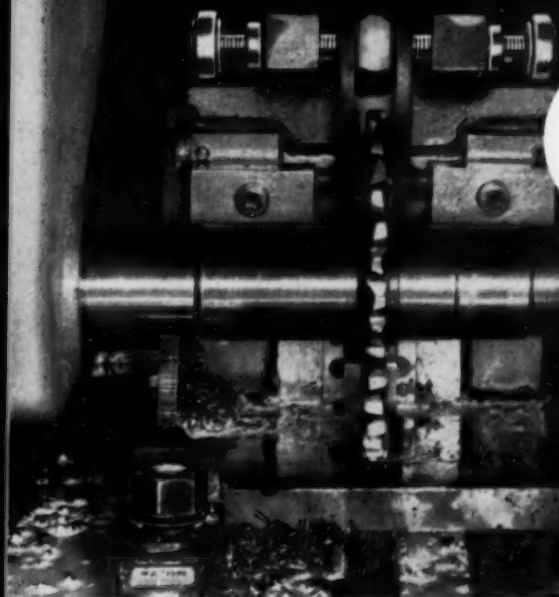


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LEIMAN BROS., Inc.

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...at North American Aviation, Inc., Los Angeles Division:

Vlier Torque Thumb Screws eliminate guesswork when supporting parts against drill or mill thrust

Prevent inaccurate machining which always occurs when work is not properly supported...

Vlier Torque Thumb Screws are simple, precision tools. They provide an accurate means of holding or supporting a part with a predetermined amount of end pressure. When used beneath or behind cutters as a positive support, they eliminate chatter, vibration and prevent deflection of the part which would result in loss of size. *Even fragile, thin-walled parts can be held securely against machining pressures without distortion.*

Impossible to overtighten... The head of the Vlier Torque Thumb Screw is designed with an accurate, spring-controlled ball-check which functions automatically. When the predetermined supporting pressure is reached, the head rotates freely, preventing overtightening of the screw. Spring pressures are determined at the factory and

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Built to last a lifetime... Design of Vlier Torque Thumb Screws is extremely simple. There is nothing to wear out; nothing to jam; nothing to get out of adjustment. By removing a Truarc ring the head can be taken apart for cleaning. Cover plates protect mov-

ing parts from dust, chips, etc., assuring years of profitable use. Order a supply of these money-savers from your Vlier distributor today.

Available in four types; 19 models



REGULAR—(Type A) For all ordinary supporting.



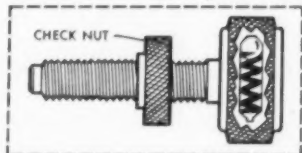
INVERTED—(Type B) Holding support applied on head end; for use where fixture space is limited.



TEE HEAD—(Type C) For use with sliding Vee blocks.



ADJUSTABLE—(Type D) Enables holding pressure to be varied by operator as needed.



In the Vlier Torque Thumb Screw, spring pressure is applied perpendicular to screw axis, eliminating inaccuracies due to wobble or "slop" as wear occurs.

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1955 Vlier Catalog

"No quick tests can establish the exact identity."

1550 deg. F. it was obviously a relatively high capacity hardening steel since a straight carbon type would have required a water quench in order to achieve this degree of hardness. No quick tests can establish

the exact identity, but it is certainly a low alloy tool steel or possibly 52100. As long as its characteristics are known the exact composition is frequently unimportant.

The author does not mean to infer that the simple and sometimes crude methods of testing discussed in the foregoing can supplant the function of a metallurgical labora-

tory. These methods of testing are meant primarily as an aid in shops where the size does not warrant a fully equipped laboratory. Almost any shop can afford the meager amount of equipment in addition to what it would normally possess to make these simple tests and anyone with some practice can produce reasonably accurate results. In fact one can, by having full knowledge relative to the various steels regularly used by a specific shop, employ these simple tests as means of exercising a measure of metallur-

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For more data circle 387 on Reader Service Card

The story of 5 benefits Wayne Screw Products gets from using **STANICUT CUTTING OIL**



Plant Foreman Al Ziegman (left) and Standard industrial lubrication specialist L. J. Loomis examine pitch diameter of screw threads. L. J. Loomis' engineering background plus his field experience in industrial lubrication, customers find, pays off for them. Lee is a graduate of Tri-State College of Indiana with a B.S. degree. Before entering field work, he completed Standard Sales Engineering School.

STANICUT 137 BC Oil solved finish problem for Wayne Screw Products Company, gave better finish on screw and machined parts like these—plus four other important benefits.

Management at Wayne Screw Products Company, Detroit, found they were not getting a completely satisfactory finish on aircraft quality stainless steel, which the plant was machining. They followed a suggestion made by their Standard Oil lubrication specialist to switch to **STANICUT 137 BC Oil**. The result: five benefits. (1) Better finish. (2) Higher quality work. (3) Longer tool life. (4) Higher production because of less down time for tool sharpening and adjusting. (5) Cutting oil costs reduced approximately 50%.

At first **STANICUT 137 BC Oil** was used in two automatic screw machines—a National Acme Multi-Spindle and a Brown & Sharpe Single Spindle. Production benefits prompted Wayne Screw Products to convert other equipment to **STANICUT 137 BC Oil**—and with similar results.

Delivering benefits like this is an old story for **STANICUT 137 BC Oil**. A Standard lubrication specialist will be happy to show you how. In the mid-west, call your nearby Standard Oil office. Or contact: Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



STANDARD OIL COMPANY (Indiana)

"The simple tests discussed here proved their worth . . ."

gical control; that is, to ensure that incoming steels are as they were ordered and to prevent or correct conditions of mixed steel.

These simple testing methods are also valuable as a supplement to a metallurgical laboratory in instances where it is necessary to check a quantity of steel in a short time. In some cases where it is required to establish the identity of a quantity of steel it is often more practical to have one or two analyses made and then match the remainder by simple tests with the known as a standard. This can be most efficiently accomplished by tabulating the data as it is obtained

with the aid of some form such as shown in Fig. 4.

With the constantly increasing number of different steels now used in most shops it has become necessary to exercise some means of control and have ready at hand means of separating steels. The simple tests discussed in the foregoing have proved their worth in many shops and no doubt others will follow suit in learning to depend upon them as a guide.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

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on any product mentioned
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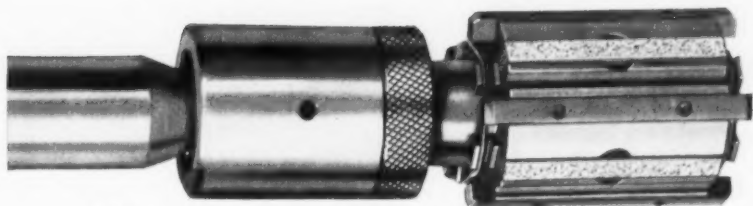
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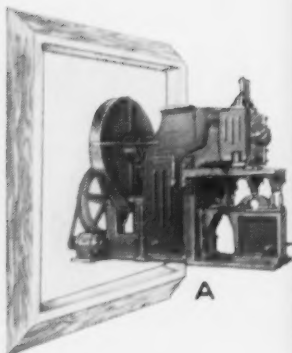
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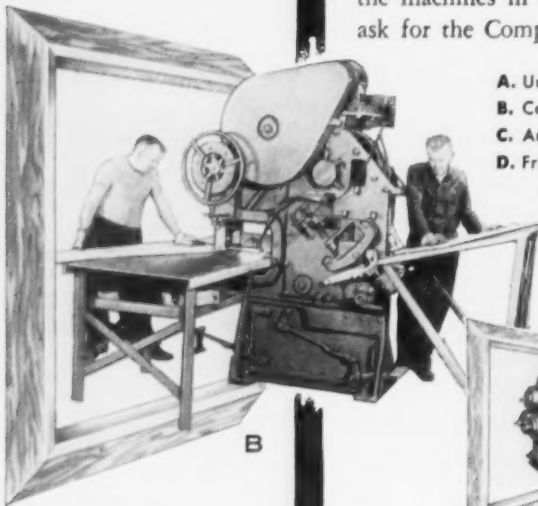
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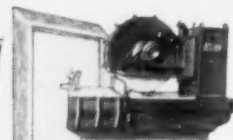


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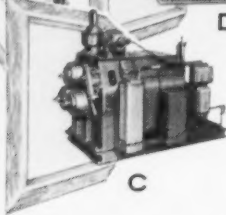


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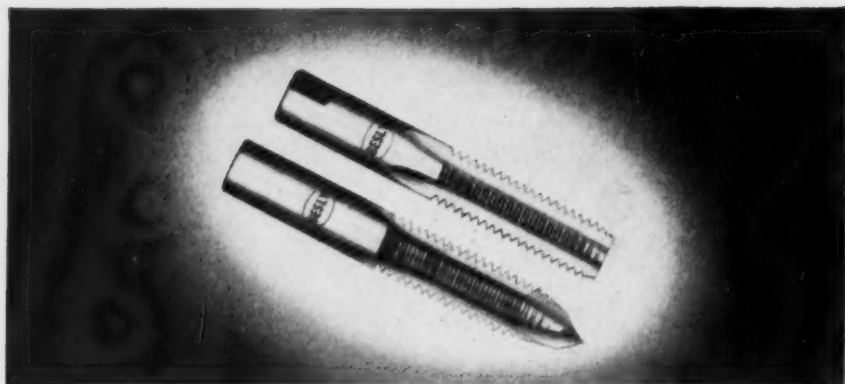
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New Besly Stub Tap for Screw Machines

*Saves Set-up Time, Fits Standard Bushings, Has Stronger Shank
Available at No Extra Cost from BESLY*

A new, shorter length tap that eliminates the need to make alterations before using it in screw machines has just been developed by Besly in cooperation with the National Screw Machine Products Association.

SHORTER SHANK, SHORTER THREADED PORTION

The shank (and threaded portions in larger sizes) of the new Stub Tap have been shortened to enable it to fit into the space between the spindle nose and tool holder of screw machines. In the past, it has been necessary for users to cut off part of the shank and even part of the threaded portion of standard hand taps to fit them into screw machines . . . or order higher priced "specials."

SIMPLIFIES BUSHING INVENTORY

The shank of a Stub Tap is the same size as its nominal O.D. This permits standard sized bushings to be used and reduces bushing inventory problems. The full dia-

meter shank provides greater strength than standard hand taps which have shanks usually turned down in the larger sizes.

FACTORY-PERFECT ACCURACY

The shank of the Stub Tap is made concentric with the threaded portion, assuring accurate alignment in the tool holder. Since it is not necessary to cut off the forward threaded portion of a Stub Tap, chamfer and back taper are maintained factory-perfect. Squares, except for two small driver flats at the end of the Stub Tap, are eliminated. This permits better holding power, better alignment and longer accuracy.

AVAILABLE IN SIZES THROUGH 1-IN.

The new Stub Tap is available at no extra cost from Besly distributors. It is made in fractional sizes from 1/4-in. through 1-in. and in machine screw sizes from No. 0 through No. 14. See your Besly distributor or write for the sizes you need for delivery June 1.



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GRINDERS**



MATTISON
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ideas from readers

FOUR time-saving suggestions for the man
in the shop

Step Drill Method Speeds Production

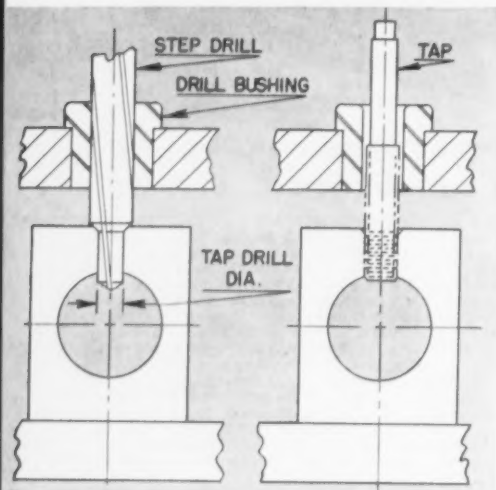
By ROGER ISETTS

When holes must be drilled and tapped in a part, a considerable amount of time is wasted in removing the drill bushing or swinging the bushing plate out of the way to

allow for tapping of the work. The accompanying sketch depicts a method that not only saves time in drilling and tapping parts, but also reduces operator fatigue, thus increasing production.

Suppose, for example, a $\frac{3}{8}$ -inch 16-thread hole is to be drilled and tapped in a block. This means the tap drill for this hole would be $\frac{5}{16}$ inch. Therefore, if the tap is to be able to pass through the drill bushing, the hole must be larger than $\frac{3}{8}$ inch. In this instance, the drill bushing has a $\frac{1}{2}$ -inch i.d. The step drill is then made with a $\frac{1}{2}$ -inch body having a $\frac{5}{16}$ -inch step. The $\frac{1}{2}$ -inch diameter supports the drill in the bushing while the small diameter of the drill enters the work. The drill is ground with a chamfer between the two diameters, thus providing a lead for the tap and allowing for the production of a better tapped hole. Since the bushing has a $\frac{1}{2}$ -inch hole, a $\frac{3}{8}$ -inch tap will pass through, eliminating the necessity for removing the bushing itself or the bushing plate.

This same method can be used for tapped holes of almost any size merely by varying the step drill diameters to suit.



Sketch showing a method for quickly and accurately drilling and tapping a hole in a part without the necessity of removing the drill bushing or swinging the bushing plate out of the way, thus reducing operator fatigue.

Cut-Off Attachment for Progressive Dies

By FREDERICK BARKER

The use of the cut-off attachment shown in the accompanying sketch allows any desired number of finished pieces — previously pierced, notched and finally scored in a progressive die and joined together—to be ejected from the die before being separated from the strip stock.

In the particular application illustrated, it was desired to produce a ten-piece strip; therefore, a ten-step ratchet was used. On the upstroke, the punch holder trips a micro-switch by means of a flipper device, as shown at A. The coil of the relay is thus energized, revolving the ratchet one tooth space. On the tenth

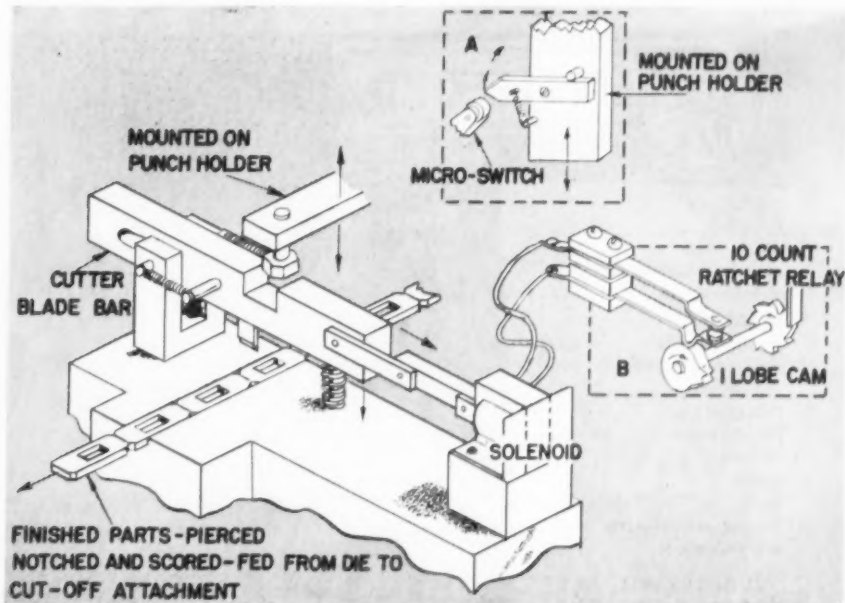
upstroke, the cam, as shown at B, has moved around, closing the circuit and energizing the solenoid, which withdraws the cutter blade bar. As the punch holder descends, it will now strike the cutter blade bar, severing the ten-piece strip and allowing it to drop free.

★ ★ ★

Spring-Like Shim Prevents Marring in Clamping Soft Metal Parts

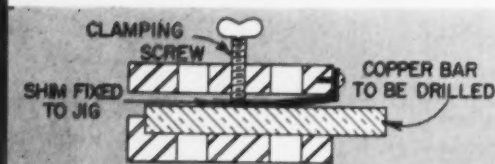
By ELMER DITTMAN

By fastening a piece of metal in a spring-like fashion to a drill jig, as shown in the accompanying sketch, the writer, an Allis-Chalmers Manufacturing Company employee,



Sketch of cut-off attachment designed for use in conjunction with progressive dies.

ideas from readers . . .



Sketch showing how clamping marks may be eliminated on soft metal parts by fastening a metal shim to the drill jig in such a manner that the shim is always between the work and the clamping screw to protect the part.

has facilitated the drilling of copper bars without marring them. The job involved the use of a clamping screw threading in from the top of the jig onto the face of the bar to be drilled. To prevent the end of the screw from marring the bar, a shim


of metal was placed under the clamping screw. However, with this arrangement, the piece of metal was not always handy and, moreover, to insert this shim into the jig and remove it each time a piece was drilled required considerable time and effort. By making the shim a permanent part of the jig, as shown in the sketch, the clamping operation was facilitated.

★ ★ ★

Safety "Valve" for Piercing Punch

By FEDERICO STRASSER

The writer was experiencing difficulty with a large panel punching die, mainly because the construction of the die was not quite as accurate



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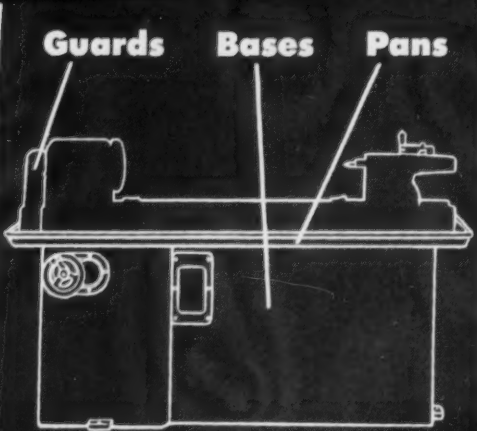
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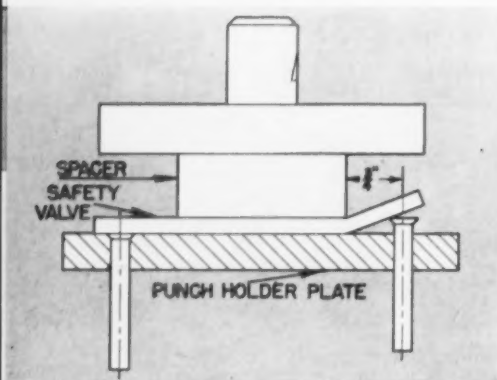
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ideas from readers . . .



Sketch showing use of safety "valve" for protecting a piercing punch from breakage due to overload during die set operation.

as it should be. In addition, the large working area of the die created difficulties in setting up the die in the press. All of these conditions tended to interfere with proper slug discharge, especially since the holes punched were small ones located at the extreme corners of the workpiece. Here, the slugs often accumulated in the clearance holes of the die openings, thereby causing frequent punch breakage.

Since the job at hand was a rush one, we did not have time to build a new die or to substantially modify the old one; therefore, we devised a temporary means to eliminate punch breakage; namely, a safety "valve" consisting simply of a piece of hot rolled steel $2 \times \frac{1}{4}$ inch that was positioned above the punch-holder plate, as shown in the accompanying sketch. Between the "valve" and the upper member of the die set a spacer block was provided which was shorter than the distance between the two piercing punches in question. Between the end of the spacer block and the punch there was a distance of $\frac{3}{4}$ inch. The stock punched was cold rolled steel sheet 0.0355 inch thick; the hole diameter in each case was 0.1 inch.

In operation, as long as the die set was performing correctly, the "valve" had sufficient strength to resist the normal cutting pressure ($P = 3.14 \times 0.1 \times 0.0355 \times 45,000 = 500$ lb.); however, as soon as slug discharge trouble occurred and the pressure became practically infinite so that the punch was in danger of breaking, the "valve" simply bent in a manner, as indicated in the sketch, and no harm was done to the punch.

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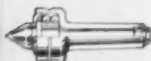
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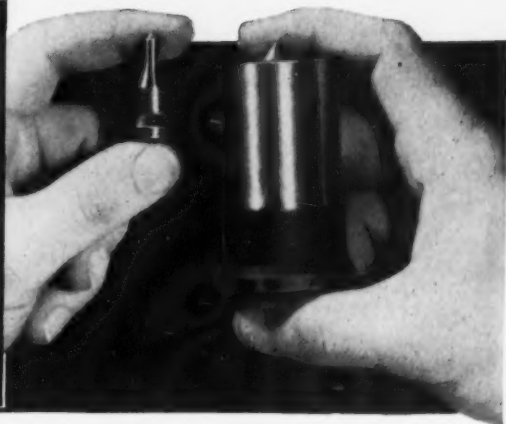
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modern machine shop 191

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The Cincinnati Milling Machine Co., Process Machinery Division, Cincinnati 9, Ohio. Flamatic Hardening Machines and allied equipment.

20. Die Casting Machine

The Cleveland Automatic Machine Co., 4932 Beech St., Cincinnati 12, Ohio. Model 200 universal high-pressure hydraulic die casting machine.

21. End Mills

Conical Tool Co., 3802 Buchanan, S. W., Grand Rapids 8, Mich. Spiral tapered end mills.

22. Insert Bits and Holders

Continental Screw Co., New Bedford, Mass. "Hy-Pro" Phillips insert bits and holders.

23. Optical Comparator

Covel Mfg. Co., Benton Harbor, Mich. No. 14 Optical Comparator for accurate checking right in the shop.

24. Stainless Steel

Crucible Steel Company of America, Box 88, Pittsburgh 30, Pa. Joining Resistal stainless steels.

25. Metal Stampings

Dayton Rogers Mfg. Co., Minneapolis 7, Minn. Metal stampings and plastic moldings.

26. Subland Tools

Detroit Reamer & Tool Co., 2830 E. Seven Mile Rd., Detroit 34, Mich. Uses and merits of subland tools.

27. Band Machines

The DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill. "Contour-matic" Band Machines for sawing, filing, grinding and polishing.

28. Leasing Plans

Dreis & Krump Mfg. Co., 7418 S. Loomis Blvd., Chicago 36, Ill. Extended payment and lease plans for purchasing and leasing the complete line of "Chicago" machines.

29. Bench Miller

Elgin Tool Works, Inc., 1771 Berteau Ave., Chicago 13, Ill. Precision vertical bench milling machine.

30. Abrasive Belt Machining

Engelberg Huller Co., 103 Seneca St., Syracuse, N. Y. Line of abrasive belt machines.

31. Jig Borer

Engineering & Commerce, 9717 Eckford Ave., Ozone Park 17, N. Y. Schroeder No. 2 Universal Jig Borer.

32. Variable Speed Pulleys

Equipment Engineering Co., 2853 Columbus Ave., Minneapolis 7, Minn. Hi-Lo automatic variable speed pulleys and Hi-Lo systems.

33. Automation

Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich. Automatically operated production machines and fixtures.

34. Quick-Change Holders

Falcon Tool Co., 20771 Ryan Rd., Detroit 34, Mich. "Kwiklok" Quick-Change Toolholders with taper interchangeable drive.

35. Felt

The Felters Co., 210 South St., Boston 11, Mass. Applications for felt.

36. Height Gages

Foster Supplies Co., 6122 Milwaukee Ave., Chicago, Ill. Stainless-chrome inspection height gages.

37. Grinding Machines

Gear Grinding Machine Co., 3901 Christopher, Detroit 11, Mich. 30-inch internal and 36-inch external grinding machines.

38. Milling Cutters

Goddard & Goddard Co., 12280 Burt Rd., Detroit 23, Mich. Unground multiple thread milling cutters.

39. Saw Sharpeners

Hamco Machines, Inc., Rochester, N. Y. Automatic saw sharpening machines.

40. Precision Machine Tools

Carl Hirschmann Co., Inc., 30 Park Ave., Manhasset, N. Y. Hauser jig borers, Tornos Swiss-type automatic screw machine, Nassovia die sinker and others.

41. Riveting Equipment

The Hi-Shear Rivet Tool Co., 8924 Bellanca Ave., Los Angeles 45, Calif. Rivets and allied equipment.

42. Deep Hole Boring

Hollow Boring Corp., 85 Prescott St., Worcester, Mass. Deep hole boring and gun drilling service.

43. Oil Filters

Houdaille-Hershey of Indiana, Inc., Filtration Division, Lebanon, Ind. Honan-Crane Multi-Cartridge Oil Filters.

44. Lubrication Chart

E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa. Lubrication recommendations for many industrial needs.

45. Band Sawing Machine

Johnson Mfg. Corp., Albion, Mich. Model M metal-cutting band saw on wheels.

46. Cutters

Keo Cutters, Inc., 19326 Woodward Ave., Detroit 3, Mich. T-slot cutters, combined drills and countersinks, center reamers, countersinks, keyseat cutters and lathe mandrels.

47. Angle Rolls

Kling Bros. Engineering Works, 1320 N. Kostner Ave., Chicago 51, Ill. Angle bending rolls for producing a wide variety of curved structural shapes or reinforcements.

48. Dies and Tools

Lamina Dies and Tools, Inc., P. O. Box 31, Royal Oak, Mich. Precision dies and tools, fixtures and special machines.

49. Threading Heads

Landis Machine Co., Waynesboro, Pa. Hardened and ground threading heads.

50. Lathe

Logan Engineering Co., Lawrence and Lamont Ave., Chicago 30, Ill. No. 6560 14-inch lathe which features a variable speed drive.

51. Milling Cutter Arbors

Lovejoy Tool Co., Inc., Springfield, Vt. Milling cutter arbors made of alloy steel.

52. Measuring Tapes

The Lufkin Rule Co., Saginaw, Mich. Tapes, rules and precision tools.

53. Air Cylinders

Lynair Inc., Jackson, Mich. Air cylinders in non-rotating, cushioned and non-cushioned types.

54. Wire Straightener

Mettler Machine Tool, Inc., 157 Adeline St., New Haven, Conn. "Shuster" Model 3A Wire Straightening and Cut-off Machine.

55. Chipless Machining

Michigan Tool Co., 7171 E. McNichols Rd., Detroit, Mich. "Roto-Flo" chipless machining process.

56. Air Cylinders

Miller Fluid Power Co., 2040 N. Hawthorne Ave., Melrose Park, Ill. 200-p.s.i. heavy-duty air cylinders.

57. Facing and Boring Heads

Karl A. Neise, 404 Fourth Ave., New York 16, N. Y. Wohlhaupter universal facing and boring heads.

58. Electric Brazier

Oliver Machinery Co., Grand Rapids 2, Mich. No. 562 Electric Brazier for band saw blades.

59. Multi-Purpose Machine

The Portage Machine Co., 1041 Sweitzer Ave., Akron 11, Ohio. Boring, Drilling and Milling Machine.

60. Taps

Pratt & Whitney, Division Niles-Bement-Pond Co., 25 Charter Oak Blvd., West Hartford 1, Conn. Ground taps.

61. Power Units

Rivett Lathe & Grinder, Inc., Dept. MMS, Brighton 35, Boston, Mass. Hydraulic power units.

62. Abrasives

Brightboy Industrial Division, Weldon Roberts Rubber Co., 95 N. 13th St., Newark 7, N. J. Rubber-cushioned stock abrasives.

63. Micrometer-Comparator

George Scherr Co., Inc., 200-MM Lafayette St., New York 12, N. Y. "Master Compar" Indicating Micrometer.

64. Press Brakes

Service Machine Co., Inc., 402 Miller St., Elizabeth, N. J. "Semco" steel press brakes and forged steel press brake dies.

65. Geared Head Lathe

Sheldon Machine Co., Inc., 4250 N. Knox Ave., Chicago 41, Ill. Sebastian 15-inch geared head lathe.

66. Roll Grinding Wheels

Simonds Abrasive Co., Philadelphia 37, Pa. Wheels used for regrounding steel mill rolls and miscellaneous rolls.

67. Solenoid Valves

Skinner Electric Valve Division, The Skinner Chuck Co., 210 Edgewood Ave., New Britain, Conn. Complete line of solenoid valves.

68. Precision Spindles

The Standard Electrical Tool Co., 2487 River Rd., Cincinnati 4, Ohio. Super precision spindles for grinding, boring, drilling, milling, routing and other work heads.

69. Thread Gages

Standard Gage Co., Inc., Poughkeepsie, N. Y. "Versa-Dial" for checking internal and external threads.

70. Dial Indicators

The L. S. Starrett Co., Dept. MD, Athol, Mass. High-precision low-friction dial indicators.

71. Hardness Testers

Steel City Testing Machines, Inc., 8817 Lyndon Ave., Detroit 38, Mich. Brinell hardness testing machines.

72. Press Brake

W. Whitney Stueck Inc., Old Saybrook, Conn. Connecticut Model 416 Press Brake.

73. Milling Machines

Sundstrand Machine Tool Co., 2539 Eleventh St., Rockford, Ill. "Rigidmils" designed for miscellaneous die block milling.

74. Clamping Blocks

Tallman Tool & Machine Corp., Rochester, N. Y. "Squar-It" Clamping Blocks and emery wheel dressers.

75. Servicing Bearings

The Torrington Co., Bantam Bearings Division, South Bend, Ind. Servicing of bearings in operation of rolling mills.

76. Carbide Tools

Vascoloy-Ramet Corp., Waukegan, Ill. Carbide blanks, tools and inserts.

77. Band Saws

W. F. Wells & Sons, Three Rivers, Mich. Band sawing machines and automatic bar feeds.

78. Toolholders

Wesson Co., 1220 Woodward Heights Blvd., Ferndale 20, Mich. Multicut holders for "throw-away" inserts.

79. Drills and Reamers

Whitman & Barnes, 40050 Plymouth Rd., Plymouth, Mich. Useful facts on drills and reamers.

80. Milling Machine Vise

Wilton Tool Mfg. Co., Inc., 925-941 Wrightwood Ave., Chicago 14, Ill. "Milomatic M-M" air-powered hydraulic milling machine vise.

81. Tapping Unit

Wisconsin Drill Head Co., 4983 N. 124th St., Butler, Wis. Model TU-415 automatic lead screw tapping attachment.

82. Floating Toolholder

W. M. Ziegler Tool Co., 13566 Auburn Ave., Detroit 23, Mich. Roller drive floating toolholder.

83. Engines

Le Roi Division, Westinghouse Air Brake Co., 1706 S. 68th St., Milwaukee 14, Wis. Models L3000, H2000 and F1500 engines which provide from 115 to 410 horsepower.

84. Slotter

Lobdell United Division, United Engineering & Foundry Co., Wilmington 99, Del. The Lobdell Dill Standard Slotter which features a non-swiveling head.

Brand New!

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hask AIR Grinder...

**most powerful
air turbine grinder
in its class!**

75,000

R.P.M.

(1/5 H.P. prony brake test)



- Permanently sealed bearings . . . never needs lubrication in air lines or grinder.
- Removable nose piece for deep grinding.
- Gyro action of turbine holds tool steady.

Here's power—SUSTAINED POWER—like you've never experienced before in an air grinder . . . power unexceeded by any other air grinder in the same price range . . . maintains its high-speed efficiency under load! Built with a lightweight, contoured, hand-fitting aluminum housing, the Haskins *hask AIR* Grinder handles easily, balances perfectly . . . excellent for the most precise grinding job. Complete kit includes: carrying case, adapter hose, mounted points, dressing stone and wrenches.

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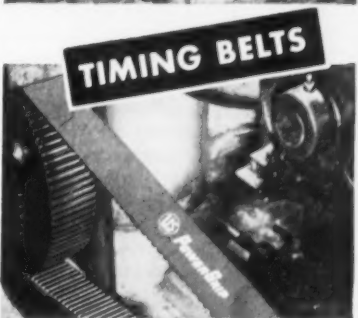
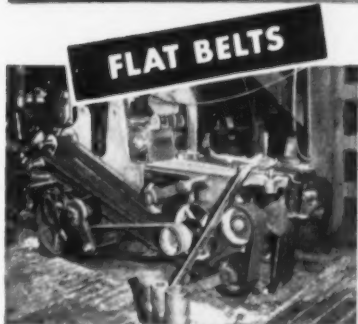
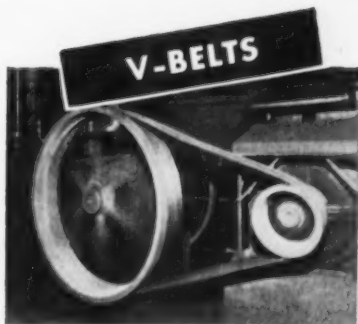
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are tested for static balance and engineered to deliver the high durability and efficiency that are built into every "U. S." Belt.

MULTIPLE V-BELTS • F.H.P. V-BELTS
SHEAVES • FLAT BELTS AND BELTING
SPECIAL PURPOSE BELTS

POWERGRIP "TIMING" BELTS AND PULLEYS



"U.S." Research perfects it... "U.S." Production builds it... U.S. Industry depends on it
UNITED STATES RUBBER COMPANY
MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Grinding Wheels • Packings • Tapes • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

For more data circle 402 on Reader Service Card

news of the industry

**Special citations . . . plant purchases . . .
new plants and expansions . . . new
appointments . . . lease plans**

ADAMAS CARBIDE PLANT WINS SPECIAL CITATION

The Adamas Carbide plant at Kenilworth, New Jersey, has been awarded one of the ten most significant manufacturing plant awards in a nationwide competition sponsored by "Factory Management and Maintenance." Selected from an original list of 500 plants nominated by leading U. S. architects and engineers, the winning plants were required to be of "general interest and significance for a broad range of plant operating executives in many types of manufacturing industries and in companies of all sizes." The Adamas plant was especially cited for incorporating "superb services ideally suited to special production processes." Criteria considered vital to the selections included adaptability for changes in production methods and processes; provisions for growth and

expansion; plant electrical services; services other than electrical; employee facilities and services; maintenance; and appearance of buildings and grounds.

The Adamas plant manufactures tungsten carbide tools, tool tips, dies and wear parts. It represents the combined planning of all first-line supervisors who were asked to outline what their departments should have in the way of safety, plant services, new equipment, plant layout, and other features.

The result of the combined department planning is a modern clean, efficient new plant, incorporating air-conditioned areas, hot water heating, an air cooling system, physical and chemical laboratories and general offices. The split-level design of the plant conforms to the land's contour. Locating the office area and shop on different levels saved much excavation and filling.



Award-winning plant of Adamas Carbide Corporation located in Kenilworth, New Jersey

MACKINTOSH-HEMPHILL BECOMES DIVISION OF E. W. BLISS COMPANY

Mackintosh-Hemphill Company has announced that its stockholders have approved, by a vote of approximately 91 per cent, the sale of the company's assets to the E. W. Bliss Co., Canton, Ohio. Mackintosh-Hemphill, which now becomes a division of Bliss, will continue to operate its plants in Pittsburgh and Midland, Pennsylvania, where it manufactures a line of cast alloy steel and iron rolls, rotary straighteners, slag handling equipment and heavy-duty engine lathes for primary producers of ferrous and non-ferrous metals. No changes in operations or personnel are contemplated. Bliss is a builder of metal-working presses and a major supplier of rolling mill equipment, can machinery and diemakers' supplies. It operates seven plants in the United States and two in Europe.

★ ★ ★

MITCHELL-BRADFORD CHEMICAL COMPANY COMPLETES NEW PLANT

The Mitchell-Bradford Chemical Co., Stratford, Conn., has announced the completion of its new, modern plant which is designed to accommodate increased production, larger offices and research facilities. The manu-

facturing area was planned in a straight-line flow system, allowing steady uninterrupted production. A large section is set up for the chemical research laboratory for product control, new product development and customer problems. The latest in architectural design and interior decorating has been incorporated in the executive and general offices. The plant is situated on approximately three acres of land to provide for further expansion.

★ ★ ★

\$750,000 EXPANSION PROGRAM NEARS COMPLETION AT PRODUCTO MACHINE

A \$750,000 expansion and modernization program is nearing completion at The Producto Machine Co., Bridgeport, Conn. The Producto foundry has undergone an extensive replacement program to make possible faster, lower-cost casting of catalog die sets and unusually large and complicated special sets. A modern cupola installation has been made, and a continuous flow ladle has been installed with continuous removal of the slag provided. In addition, a new dust collector has been placed on the stack of the cupola, which uses a washing system to prevent the spread of smoke, soot and fly ash. A new blower system assures more efficient and complete combustion which, in turn, minimizes smoke, fly ash and cinders entering the stack or the smoke control system. A modern



New, modern plant of The Mitchell-Bradford Chemical Co., Stratford, Connecticut

news of the industry . . .

Wheelabrator cleaning machine will vastly improve casting appearance. Finally, six new ventilating fans with a total exhaust capacity of 168,000 cubic feet per minute completely replace the air in the foundry every five minutes.

Concurrently, a unique combination production and accounting control

system has been perfected that has resulted in improved marketing techniques and customer relations since it was initiated last summer. The system employs internal communication lines to a central recording office which coordinates production information for the IBM-operated statistical center.

Producto has also added several major machines to its production lines. These machines include a Norton universal grinder for grinding large guide pins and shoulder pins; a Pratt &

Whitney Model 3B jig borer for handling large die sets requiring extreme accuracy; a large-size flame cutting machine for cutting straight forms and contours in steel plate; a Bullard "Cut-Master" for machining large catalog or special sets; a Monarch "Air-Gage Tracer" lathe; a large honing machine; a Pratt & Whitney thread miller; an automatic shank welder; several Blanchard grinders; and many other machine tools. As part of the overall modernization program at Producto, the plant building has undergone a complete "face lifting." Refacing of the entire exterior is progressing. Addition ad-

only FEDERAL has so many big features!

• **Patented Brake Design.** Automatic release, if desired.

• **Solid Web-Type Flywheels.** An important safety factor.

• **Non-Repeat Clutch.** A feature exclusive with Federal.

• **Timken Bearing Flywheels.** Eliminate wear on shaft.

• **Longer "V" Ways, Gibs.** Hand-scraped to perfect alignment.

- **OVERSIZED CRANKSHAFTS**
- **GENEROUS SHUT HEIGHT**
- **FRONT OPERATED RECLINE**

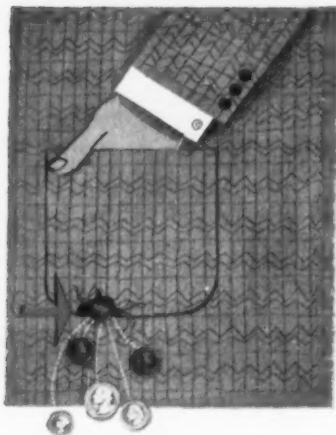
Here are important features that give FEDERAL users a definite edge, production-wise and cost-wise. These rugged, precision-built presses boost output, eliminate accidents. Offered in four major classes—from 6 to 95 tons. Write for new catalog today!

THE FEDERAL PRESS COMPANY
504 Division Street, Elkhart, Indiana

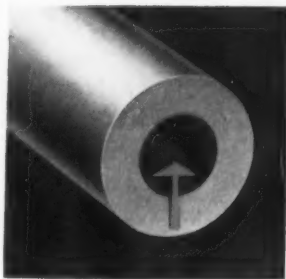
FEDERAL *Open End, Automatic* PRESSES

30 Years of Quality Construction

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a hole here costs money...



a hole here saves money

Crucible Hollow Tool Steel Bars put savings into the pockets of the metal-working industry. There's no need for costly drilling, boring, cutting-off or rough-facing operations. For the hole is already in the steel you buy. You save production time, machine capacity — avoid scrap losses.

Crucible Hollow Tool Steel Bars are now available in any of our famous tool steel grades . . . in almost any combination of O.D. and I.D. sizes. And you get *immediate* delivery of five popular grades — KETOS oil-hardening, SANDERSON water-hardening, AIRDI 150 high-carbon high-chromium, AIRKOOL air-hardening, and NU DIE V hot-work tool steels.

Your Crucible representative can show you how to save time and money with Crucible Hollow Tool Steel. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 30, Pa.*

CRUCIBLE

first name in special purpose steels

Crucible Steel Company of America

For more data circle 404 on Reader Service Card

June, 1955

modern machine shop 201

news of the industry . . .

joining acreage has been acquired for proposed expansion of the manufacturing area.

★ ★ ★

NORTON EQUIPS CALIFORNIA MANUFACTURING PLANT

Norton Co., Worcester, Mass., has announced that a new plant for the

manufacture of grinding wheels is being equipped and will be opened January 1, 1956, at Santa Clara, California. The one story plant, located at 2555 Lafayette Street, was purchased last Fall. Intentions at that time were to convert it into a warehouse; however, in the interests of providing better service to customers in the far west, it was later decided to set up manufacturing operations in the midst of the rapidly expanding West Coast market. The new Norton plant will manufacture a full line of vitrified,

organic and diamond wheels. Renovating and equipping the plant will cost approximately a million dollars. Much of the equipment is now being purchased or specially built by Norton to conform to the most modern wheel-making methods used at the main plant in Worcester. The building contains 50,000 square feet of factory and office space and is of modern concrete construction.

George A. Garrison, formerly superintendent of packing and shipping at the Worcester plant, has been named plant manager. Others who will assume management posts are Lennert G. Jacobson, office manager;



ACME dowel pins
133
STANDARD SIZES
precision or oversized

Sizes range from $\frac{3}{8}$ " to 6" in length— $\frac{1}{8}$ " to 1" in diameter. Precision pins are hardened and ground to .0002" or .001" over nominal diameter—oversized from .002" to .005".

Acme Pins are case hardened to 60-62 Rockwell "C" scale and core hardened to 36-38. These pins will break before bending or mushrooming—preventing misalignment or breaking of doweled parts. A special lubricant is used on pins to prevent scoring when being driven in and out of holes.

Order from your distributor—or
write for Acme Dowel Pin folder and
name of distributor nearest you.



ACME INDUSTRIAL COMPANY

212 N. LAFLIN STREET, CHICAGO 7, ILLINOIS

Manufacturers of standard dowel pins • Chamfer micrometer gages • Drill jig bushings • Portable bench centers • Roughness comparison specimens • Hardened and ground parts manufactured to order

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Keep your eye on Buckeye

**and this ALL-NEW
power-packed grinder
—weighs just 4½ lbs.!**

You'll look a long while before you'll find a grinding job that can't be handled by one of these NEW Buckeye horizontal grinders! Plenty of power to handle a 6" wheel on heavy work . . . can be used with roll-type abrasives or wire brush, and will do a top-notch job with either . . . can even be used with a tool post holder for accurate work.

You'll like the built-in muffler that cuts down exhaust noise, yet has no external parts to add to tool diameter. You can adjust the exhaust deflector to any position in a full 360° circle. Steel case encloses tool at largest diameter, provides added protection, insures longer wear.

Maintenance on this tool is amazingly simple. Tool can be disassembled without any special tools, and all working parts are readily accessible for checking and servicing when necessary. Available in four speeds, 15,000 to 6,000 RPM. Capacities to 4" vitreous wheel, 6" organic wheel.

Catalog G-10 has the full story on these all-new Buckeye grinders, plus complete information on the most complete line of portable, air-powered abrasive tools available anywhere. Write—today—for your copy.



Buckeye Tools
CORPORATION
DIVISION 17 • DAYTON 1, OHIO

producers of
the world's first
successful
rotary air tools

IN CANADA: Joy Manufacturing Co., Ltd., Galt, Ontario

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news of the industry . . .

Fletcher G. Bevis, accountant; Duane Barnhart, control engineer; Frederick H. Mattson, foreman of mixing, molding and firing; and Martin T. Johnson, foreman of finishing operations, packing and shipping. Only supervisory personnel will be taken to Santa Clara from Worcester. Although this will be the first Norton grinding wheel manu-

facturing plant in the United States outside of the main plant at Worcester, the Santa Clara plant will be the 19th center of Norton manufacturing operations throughout the world.

★ ★ ★

J. D. DEWITT ELECTED TO HOLO-KROME BOARD

J. Doyle DeWitt, president of the Travelers Insurance Company, has been elected to the board of directors of the Holo-Krome Screw Corp., Hartford, Conn., according to Wilbur C. Stauble, company president. Mr. DeWitt, who is president and a director of all four Travelers companies, also is a director of the Hartford National Bank & Trust Company, Veeder-Root, Incorporated and the Travelers Broadcasting Company. Other members of the Holo-

When you want a "soft" hammer
that's **BETTER, SAFER**
COSTS LESS AND
LASTS LONGER

That's when you want
C/R
Jawhead

They do more work with fewer blows! The secret—less rebound, longer striking contact. Faces won't slip, fly off, crack, or spark. Ideal for delicate parts, finishes. C/R Jawheads cost less. Buy C/R Jawhead from your local industrial supplier.

CHICAGO Rawhide MFG. CO.

1301 Elston Ave. Chicago 22, Illinois
In Canada: Super Oil Seal Mfg. Co., Ltd.,
Hamilton, Ontario



Change faces
in seconds.
Threaded collar
locks them in.

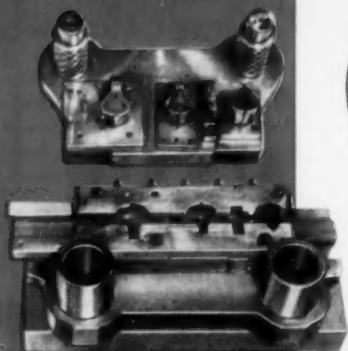
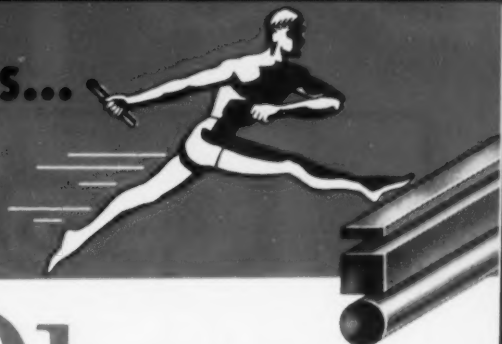


J. Doyle DeWitt

For more data circle 407 on Reader Service Card

Lewyt Corp. says...

**"for long run dies
we prefer..."**



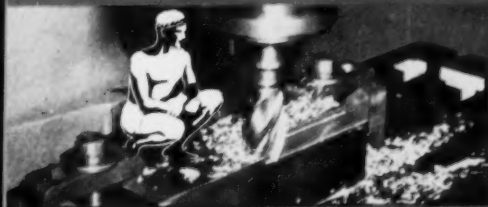
Olympic FM DIE STEEL"

● Olympic FM six-station progressive die with automatic feed—manufactures "damper cages" from .031 electro-galvanized cold rolled steel used in Lewyt Vacuum Cleaners.



Photo courtesy of Lewyt Corp., Boston 13, MA

Lewyt Corporation specifies Olympic FM because...



"... Olympic FM yields a superior machined finish... does not tear."

"... Olympic FM machines much easier than other hi carbon-hi chrome steels... increases tool life."

"... die performance is excellent."

Latrobe's new Olympic FM is a DESEGATIZED® High Carbon-High Chromium die steel which has given die makers improved machinability for thousands of long run tools and dies. Improved machinability is made possible through the addition

of alloy sulphides uniformly dispersed by the DESEGATIZED® process of manufacture.

For easier machining and long-lived tools and dies, order Olympic FM die steel... over 250 sizes regularly stocked at 10 convenient warehouse locations.

Branch Offices and Warehouses:

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| Boston | Detroit | Philadelphia |
| Buffalo | Hartford | Pittsburgh |
| Chicago | Los Angeles | St. Louis |
| Cleveland | Milwaukee | San Leandro |
| Dartmouth | Newark | Toledo |

Sales Agents:

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| Albuquerque | Denver | Wichita |
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| Brussels | Madrid | Rotterdam |
| Dusseldorf | Milan | Vienna |
| Geneva | Paris | |

LATROBE STEEL COMPANY

MAIN OFFICE AND PLANT
LATROBE, PENNSYLVANIA

news of the industry . . .

Krome board are Graham H. Anthony, chairman of the executive committee of Veeder-Root; John H. Chaplin, chairman of the board, Veeder-Root; Ralph S. Damon, president, TransWorld Airlines; Milton H. Glover, senior vice president, Hartford National Bank & Trust Company; Lucius F. Robinson, Jr., of Robinson, Robinson and Cole; Harvey L. Spaunberg, president of

Veeder-Root; and Mr. Stauble, who also is a director of the Hartford Gas Company and Colt's.

★ ★ ★

**W. C. BERGSTROM ELECTED
PRESIDENT OF WELDON TOOL**

The Weldon Tool Co., Cleveland, Ohio, has announced the election of Walter C. Bergstrom as president, succeeding his father, Carl A. Bergstrom, who has become chairman of the board of directors. Paul R. Hatch has been appointed executive vice president. Mr. Hatch was formerly associated with the Brown & Sharpe Manufacturing Company as vice president of sales.

★ ★ ★

**AMERICAN SAW BUILDS NEW
HACK SAW PRODUCING PLANT**

American Saw & Manufacturing Company has recently begun operation of a new hack saw producing plant at East Longmeadow, Massa-



**NEW NESTING TYPE
TOTE PANS**

Sturdy 16 ga. metal.
20" long x 12" wide
x 6 1/4" deep. Drag
holes and handles at
both ends.

J. L. LUCAS & SON, INC.
Bridgeport 5, Conn.

For more data circle 409 on Reader Service Card

Get a better "SURFACE GRINDER" job at less cost

THE EASIEST TO SET TOOLS ON THE MARKET

RADIUS DRESSER \$39.00

ANGLE DRESSER \$44.00

Diamond \$7.00

Diamond \$7.00



ORDER DIRECT
on our 10 day
money back
guarantee



Chatter Resistant, Spring Loaded Spindle

Hardened shaft-bearing adjustable for wear.
Diamond always perfectly centered.
Easily set adjustable 180° stops.

10" Wheel size for DoALL and NORTON
Grinders—\$44.00. Diamond \$7.00.

SPECIAL 20" Wheel Size \$110.00.

Ball Thrust Bearing. 24
Precision Ground Surfaces. Can be set
very accurately with a Protractor or
Sine Bar. Works underneath the wheel.
Large bearing surfaces.

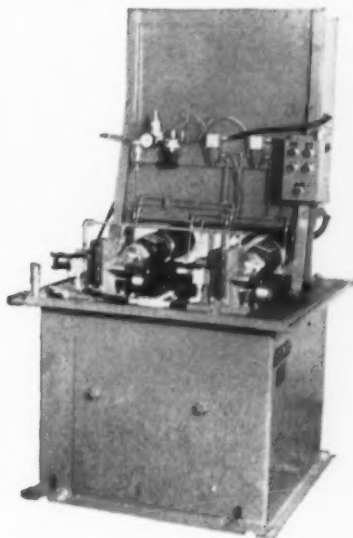
The "Mighty Midget" Line

SPERMAN METAL SPECIALTIES • 2199 E. 21st ST. • BROOKLYN 29, N. Y.

For more data circle 410 on Reader Service Card

Automation Speeds Up Hole Drilling

**New Machine
Drills 40 Pieces
Per Minute**



DRILLING at a higher production rate and a lower production cost is the result achieved by applying the principles of automation in the designing of this new Govro-Nelson Automatic Drilling Machine for drilling a .135" hole in a brass part.

The machine incorporates two independent Govro-Nelson Automatic Drilling Units, each being completely interlocked with an air-operated magazine which is kept filled by the operator or mechanically.

The parts are automatically clamped, drilled and ejected into a chute, permitting complete automation. Output rate: 40 pieces per minute.

If you would like to speed up your production rate and reduce production costs on drilling operations, send samples and part prints for our engineering staff's recommendation. No obligation.

**WRITE FOR
*Literature***

GOVRO-NELSON CO.

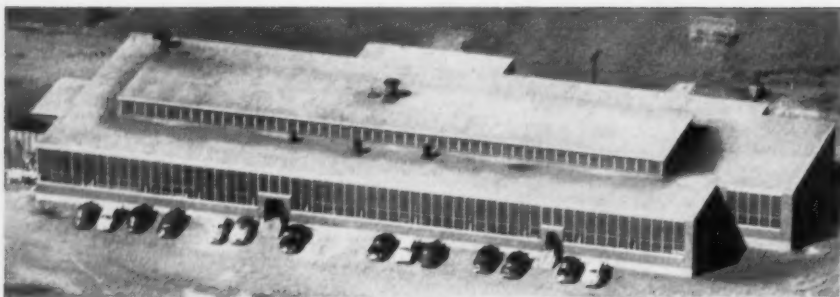
Machinists of Precision Parts for 32 Years

**1933 Antoinette
Detroit 8, Mich.**

Automatic

DRILLING UNIT

For more data circle 411 on Reader Service Card

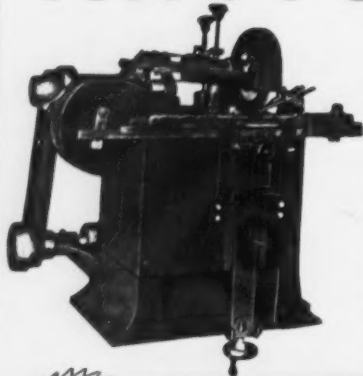


New hack saw producing plant of American Saw & Mfg. Co., East Longmeadow, Massachusetts

chusetts. American Saw's main plant and headquarters are located in nearby Springfield. The new plant was built to give the company a much needed capacity boost and to serve as the base for future expansion.

The East Longmeadow plant is a modern one-story building organized around a straight line production system. Steel for the hack saw blades enters at one end of the plant and moves continuously through the series of pro-

PAYS FOR ITSELF!



by sharpening just one gross of hack saw blades

You can resharpen a gross of hack saw blades at least 6 times—actually saving you the price of this machine.

WARDWELL MODEL EC COMBINATION GRINDER is the only single unit grinder adaptable for hack, band and circular saws that does not depend on the shape of the grinding wheel to form the shape of the tooth. This unique feature enables operator to grind a variety of blades without dressing or changing wheels.

Write for Bulletin EC Today.



WARDWELL

MANUFACTURING CO.

3803 Ridge Road, CLEVELAND 9, OHIO

Maker of largest line of saw and tool sharpening machines

For more data circle 412 on Reader Service Card

5

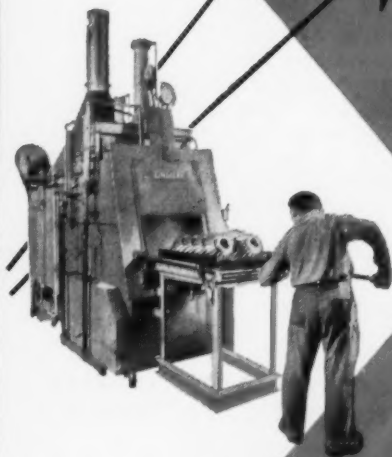
FURNACES IN ONE

the **LINDBERG** Carbonitriding Furnace

Yes, it's many furnaces in one! It's designed not only for carbonitriding . . . but also for hardening, carburizing and carbon restoration. It's self contained . . . it's easy to maintain!

10 reasons why Lindberg Carbonitriding Furnaces are better

1. Heating is by new type, gas-fired, vertical radiant tubes. They weigh only 29 pounds each . . . can be changed in two minutes.
2. Vertical radiant tubes last longer . . . often two or three times as long.
3. Quench tank is built-in . . . no costly excavation or piping necessary.
4. Quench tank has fin type oil cooler . . . maintains oil at proper temperature.
5. Specially designed chamber purges work before it enters heating chamber.
6. Special check-light system tells you where charge is at any given time.
7. Control of heating and quenching cycle is automatic.
8. Lindberg Carbonitriding Furnaces are made for automatic, semi-automatic, or manual charging.
9. Lindberg Carbonitriding Furnaces have been tested under three years of rough operating conditions.
10. Lindberg "Hyen" generators which supply atmosphere for Lindberg Carbonitriding Furnaces are instantly adjustable for many different types of atmospheres.



*For full details,
ask for bulletin #241*

LINDBERG FURNACES

Lindberg Engineering Company • 2469 West Hubbard Street • Chicago 21, Illinois

news of the industry . . .

duction, heat treatment and inspection steps to the stock facilities at the other end of the plant. Key production equipment was specially designed and built for the new plant by American Saw's

machine tool division. A battery of gas-fired furnaces is installed in the plant for the heat treatment of both hand and power hack saw blades. Furnace temperatures are accurately controlled by electronic regulators. The company manufactures and markets the "Lenox" line of band saw blades, hack saw blades, ground flat stock and hole saws.

★ ★ ★

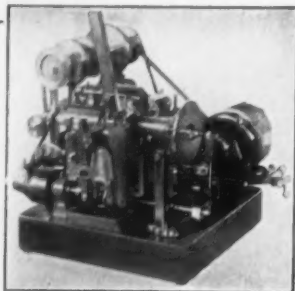
F. J. PETERS

F. J. Peters, vice president of National Automatic Tool Co., Inc., Richmond, Ind., died during a recent executives conference at Natco. An employee of Natco since 1921, Mr. Peters was appointed chief engineer in 1934 and was elected vice president in charge of engineering in 1948. During his long tenure of employment, Mr. Peters designed and developed many intricate mechanical fixtures which were necessary for precision boring and drilling operations.

★ ★ ★

GISHOLT MACHINE COMPANY ELECTS TWO NEW OFFICERS

Two new general officers have been elected by the board of directors of the Gisholt Machine Co., Madison, Wis. Frederick L. Chapman, formerly of sales, has been elected a vice president.



WALTHAM

Pinion and Gear Cutting Machines

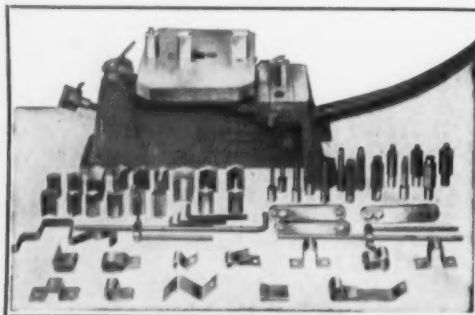
with revolving cutter will make 1, 2 or 3 successive cuts for watch pinions or may be used for fine pitch gears up to 1 1/2" dia. Blanks are held and indexed by work spindle and usually supported by a tail center. Only straight teeth can be cut.

WALTHAM MACHINE WORKS, INC.

BOX 48 • WALTHAM, MASS.

Pinion and Gear Cutting Machine, Thread Milling Machine, Cylindrical Sub-Presses, Cutter Sharpening Machine, Small thread milling and gear cutters, Small special machinery.

For more data circle 414 on Reader Service Card



Multiform

BENDER CUTTER

Users report the Multiform Bender one of the handiest tools in the shop. No special tooling . . . Bends, Cuts, Punches, Flats, Rounds Into Any Shape, Clamps, Brackets, Springs, Busbars, Wire Forms, Aircraft Work, Steel Rule Dies, Etc.

**AIR OR HAND MODELS FOR UP TO
1/4" to 4" MATERIAL**

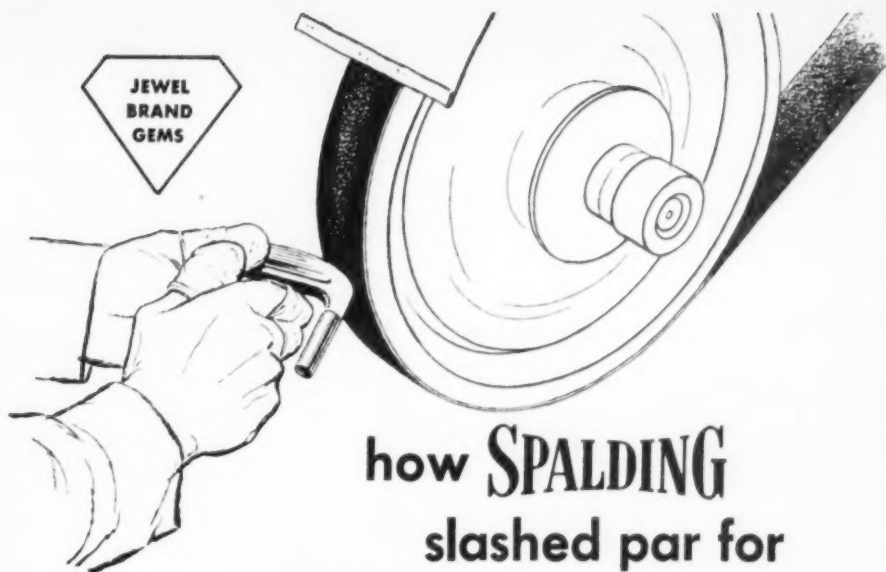
Write for brochure which illustrates and describes the four bender models.

J. A. RICHARDS CO.

Dept. 6-M

Kalamazoo, Mich.

For more data circle 415 on Reader Service Card



how SPALDING slashed par for golf club finishing costs!

Smoothing and polishing finely balanced stainless steel golf clubs used to be a costly, time-consuming operation — until Jewel Brand Abrasive Engineers helped solve the problem once and for all at the world-famed A. G. Spalding & Bros. Inc., sporting goods plant in Chicopee, Massachusetts. After a careful, on-the-job analysis of the exact finishing requirements, experienced Jewel Brand Engineers were able to select an abrasive belt that not only smoothed and polished precision-made putters and irons faster and easier but brought savings of up to 75%.

This is just one of many examples

of the special knack Jewel Brand Abrasive Engineers have for solving out-of-the-ordinary finishing problems. Combine this ability with the fact that Jewel Brand Abrasive Belts have earned an industry-wide reputation for longer wear plus faster, cleaner cutting action and you have the reason why cost-wise manufacturers everywhere turn to Jewel Brand *first* for finer finishing. Why not prove the advantages of this combination for yourself. Call your nearby Jewel Brand Abrasive Engineer or Industrial Distributor today or write us direct. Abrasive Products, Inc., 507 Pearl Street, South Braintree 85, Mass.



For more data circle 416 on Reader Service Card

news of the industry . . .

George M. Class, formerly of engineering, has also been elected a vice president.

Mr. Chapman has been made a member of the board of directors, succeeding Claude K. Swafford who re-



F. L. Chapman (left) and G. M. Class

tired earlier this year. Both men have been associated with Gisholt for over 25 years.

★ ★ ★

NORTON ADOPTS DRIVER TRAINING AND LICENSING PROGRAM

Faced with excessive maintenance costs on electric trucks and other mobile materials handling equipment, Norton Co., Worcester, Mass., has adopted a program of driver training and licensing. Many of the repairs were of the unnecessary type, brought on by misuse of equipment. Fortunately, the personal injury problem was negligible. An analysis of the problem indicated that many drivers, though conscientious, had bad driving habits which needed correction. The study also showed that many of the major repairs were

PYRO Radiation Pyrometer



Determines spot temperatures of heat-treating furnaces, fire boxes, kilns and forgings accurately—instantly. No thermocouples, lead wires or accessories needed. Temperature is recorded on direct-reading dial at press of

button. Two double ranges. Write for FREE Cat. #100.

The PYROMETER INSTRUMENT Co.
New Plant and Lab., Bergenfield 42, N. J.

For more data circle 417 on Reader Service Card



Powered by the press ram... independent of the die

2 SIZES Cuts steel up to $\frac{1}{8}$ " thick

3" WIDE \$69 6" WIDE \$95

Guaranteed — money back if not 100% satisfied

New LOW prices on the JACO AUTOMATIC STOCK REEL



WRITE FOR FULL DETAILS TODAY!

Dealer Inquiries Invited

JACO DEVICES, INC.

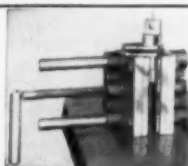
98 High Street
HINGHAM, MASS.

For more data circle 418 on Reader Service Card

212 modern machine shop

CROSSLEY "Shur-Grip" Drill Vise

For fast, accurate drilling, reaming, tapping.



Built-in parallels. Hen die swivels. V grooves hold rounds up to 2", both vertical and horizontal. 3-way vise holds square, rectangular and round parts.

Write for illustrated circular.

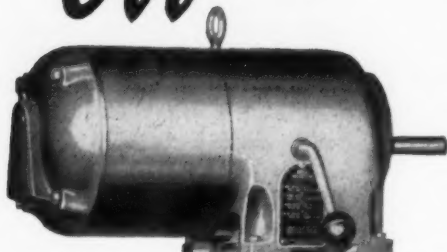
CROSSLEY MACHINE & TOOL CO., INC.
185 YORK AVE PAWTUCKET, R. I.

For more data circle 419 on Reader Service Card

June, 1955

LIMA GEARSHIFT DRIVES

Offer



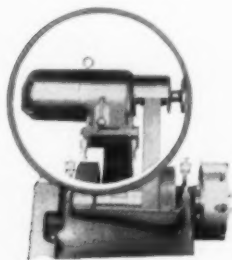
- ★ INCREASED PRODUCTION
- ★ GREATER MACHINE FLEXIBILITY
- ★ LOWER OPERATING COSTS

If you want to *increase* production and *reduce* operating costs—eliminate obsolete overhead lineshafting!

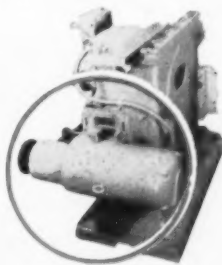
LIMA GEARSHIFT DRIVES have been designed to individually motorize all types of machine tools and production equipment — economically.

Why not let our experienced Sales Engineering Staff help solve your motorizing problems—an accurate survey of your requirements involves no obligation.

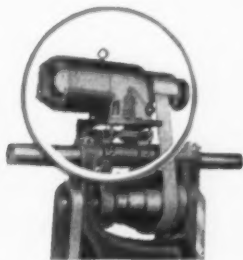
Write today for complete information.



LATHE



SHAPER



MILLING
MACHINE

LIMA

Coast To Coast Representation
GEARSHIFT DRIVES & MOTORS

THE LIMA ELECTRIC MOTOR COMPANY



171 FINDLAY ROAD, LIMA, OHIO

For more data circle 420 on Reader Service Card

June, 1955

modern machine shop 213

news of the industry . . .

brought on by inexperienced drivers using the equipment when they had no business doing so.

The solution to the problem had two phases: first, a thorough training program for all drivers, and second, a plan to ensure that only properly trained drivers identified by a license button

would be allowed to drive the equipment. An actual driving test through an obstacle course was given all drivers.

★ ★ ★

FRANK O. HOAGLAND RECEIVES A.S.M.E. 75TH ANNIVERSARY MEDAL

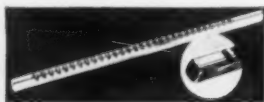
Frank O. Hoagland, master mechanic at Pratt & Whitney, Division of Niles-Bement-Pond Co., West Hartford, Conn., was recently awarded the 75th Anniversary Medal of the American Society of Mechanical Engineers in recognition of his valued services extending over many years in advancing the engineering profession. The award was made to Mr. Hoagland as "the member in the Hartford section who had done the most to further the aims and objectives of the society." Presentation of the medal to Mr. Hoagland was made by Nicholas Welch, director of research and development engineering, American Hardware Corp., New Britain, with A. H. d'Arcambal, president of Pratt & Whitney, assisting therein.



A du Mont *Minute Man* Kit

like this is just the ticket when you cut occasional keyways of various sizes. You can do the job in one minute for as little as a penny a keyway — $\frac{1}{16}$ " to 1" keyways in $\frac{1}{4}$ " to 3" bores.

**Cut YOUR
KEYWAYS
in SECONDS
for CENTS**



For Quantity Keyway Production "Minute Man" Production Type Push Broaches are now available from stock.

For Square Holes

"Minute Man" Square Broaches come in mighty handy — for accurate square holes in boring bars, no filing; for dies, jigs and fixtures; for low cost square couplings instead of expensive splines.



The du MONT CORPORATION, Greenfield, Mass.

MAIL FREE BROACH CATALOG AND PRICE LIST \$ describing 25 standard kits, 23 standard broach sizes, 71 bushing sizes, 10 standard production-type broaches, 8 standard square broaches — all low cost, quick delivery.

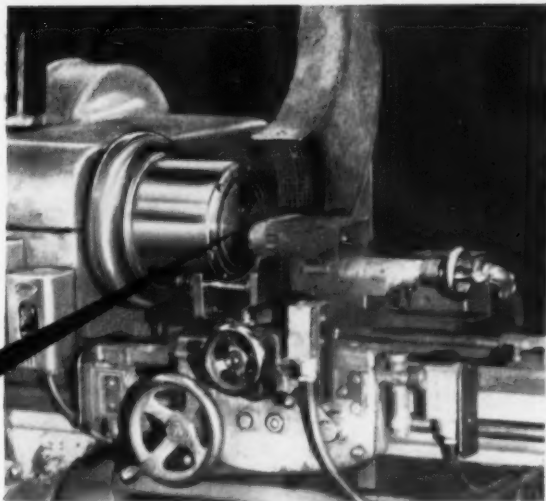
Name

Company

Address

For more data circle 421 on Reader Service Card

**Magna-Lock
Magnetic Chuck
at Wabash
Division,
Raybestos-
Manhattan,
Inc.**



SOLVES PROBLEM OF HOLDING THIN WORK-PIECE

THE JOB: Machining spiral groove .030" wide, .015" deep with 1/16" space between grooves on steel plate faced with copper friction material.

THE PROBLEM: To hold 1/16" thick copper-faced steel plate firmly on a lathe during the grooving operation.

THE SOLUTION: A Hanchett MAGNA-LOCK Rotary Magnetic CHUCK holds work piece which is machined at a spindle speed of 600 RPM.

THE RESULT: 2,400 pieces machined per 8-hour shift. Scrap and rejects run less than 2%.

Here you have another example of how Hanchett Magna-Lock Magnetic Chucks can increase your machine's productivity.

Magna-Lock offers a complete line of rotary, rectangular, swiveling and vertical face magnetic chucks, magnetic sine chucks, parallels and accessories. Magna-Lock Rectangular Chucks have 22% more magnetic area, permitting work pieces to be held to the extreme edges of the chuck. They are of welded *all-steel* construction, shock- and moisture-proof.

Get Magna-Lock for extra holding power that holds an extra margin of profit for you! WRITE TODAY, Dept. MM-65.

Request Magna-Lock as original equipment on your new machines.



Hanchett MAGNA-LOCK CORPORATION

Magnetic Chucks and Devices

BIG RAPIDS, MICHIGAN, U.S.A.

For more data circle 422 on Reader Service Card

news of the industry . . .



Nicholas Welch (right), director of research and development engineering, American Hardware Corporation, is shown presenting Frank O. Hoagland (center), master mechanic, Pratt & Whitney, with the A.S.M.E. 75th Anniversary Medal, with A. H. d'Arcambal (left), president of Pratt & Whitney, assisting.

Mr. Hoagland has been very active in the A.S.M.E. since joining the organi-

zation in 1912. Among his activities have been chairmanship of several national A.S.M.E. committees and the vice presidency in 1938. In 1953, he was presented with the Standards Medal by the American Standards Association in recognition of his long service in the development and practical application of industrial standards, and in 1915 he was the recipient of a gold medal, presented by the government at the Pan-American Exposition, in recognition of his outstanding contributions in the development of firearms. Mr. Hoagland is a recognized professional engineer and is the holder of numerous patents.

★ ★ ★

FRANKLIN BALMAR CORPORATION ELECTS OFFICERS

The directors of the Franklin Balmar Corp., Baltimore, Md., have an-

SCREW-PRESS POWER FOR HEAVY WORK

**WHITNEY-JENSEN No. 40
BALL BEARING PUNCH**

**5/8" HOLE
THRU**

**5/8" MILD
STEEL**

Depth of throat 3 1/2" Weight
Height of throat 2" 66 lbs.

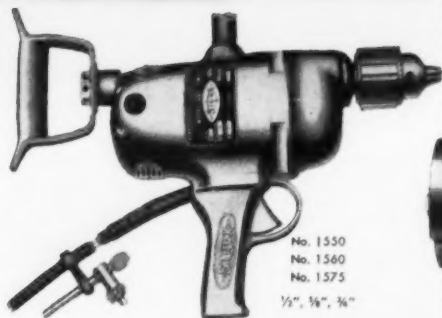
WHITNEY METAL TOOL COMPANY
720 FORBES ST., ROCKFORD, ILLINOIS



WRITE FOR BIG CATALOG!

Since 1910

For more data circle 423 on Reader Service Card



No. 1550
No. 1560
No. 1575
1/2", 3/4", 1"

ELECTRIC DRILLS

Advanced Design
Balanced Power
Rugged Construction
A Size for Every Need
Sioux Dependability
No Drill is Built to Last Longer



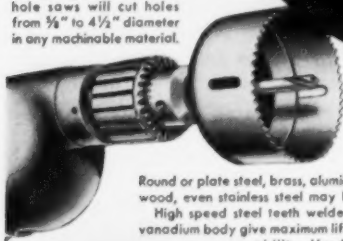
PORTABLE GRINDERS

A Dependable, Heavy Duty Tool for Grinding, Buffing, Wire Brushing. 5" and 6" Wheel Diameters. Carefully Balanced for Easy Handling. Sioux Quality Throughout



HIGH SPEED HOLE SAWS

Sioux high speed teeth hole saws will cut holes from 1/2" to 4 1/2" diameter in any machinable material.



Round or plate steel, brass, aluminum, bronze, wood, even stainless steel may be cut.

High speed steel teeth welded to chrome vanadium body give maximum life and cutting ability. Used in electric drills, drill press, or lathe.

WIRE WHEEL BRUSHES



Durably built of special brushing wire with wide face, even trim, perfect balance. Designed for heavy duty cleaning, removing, deburring, descaling, roughing, buffing, and polishing.

Torque or saucer shaped brushes are fast workers for body repair, removing paint, scale or corrosion, cleaning welded joints, etc. Used with Sioux flexible shafts or portable tools the broad brushing area cleans large areas in less time.



USE SIoux ALL THE WAY THROUGH

SOLD ONLY THROUGH
AUTHORIZED DISTRIBUTORS

ALBERTSON and CO., INC.

SIoux CITY, IOWA, U.S.A.

ELECTRIC DRILLS, SANDERS, POLISHERS,
BENCH GRINDERS, ABRASIVE DISCS,
PORTABLE GRINDERS, ELECTRIC HAND
SAWS, FLEXIBLE SHAFTS.

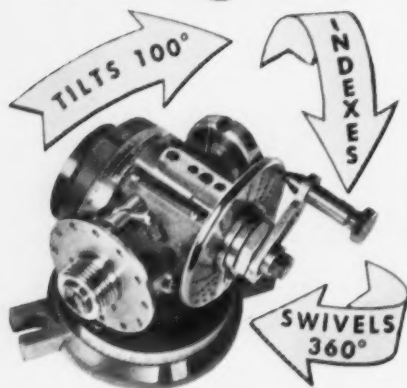
For more data circle 424 on Reader Service Card

FOR FASTER PRODUCTION

the

ELLIS

dividing head



Although it is built to fine instrument standards, the ELLIS is a really rugged tool room or production tool that's designed for unusual versatility. Its universal motions — swiveling in two planes — will save time and increase profits and accuracy on your millers, grinders, drill presses and jig borers. It has 6½" swing, or 11" swing when used with riser blocks. Work may be held between centers, or in chucks or collets. To save rehandling of work, and to save money, investigate the ELLIS by writing for complete details!

**NICHOLS-MORRIS
CORP.**

76-H MAMARONECK AVE.
WHITE PLAINS, N. Y.

news of the industry . . .

nounced the election of John N. Merkle, formerly president, as vice chairman of the board of directors. Julius J. Kirchhof, formerly executive vice president, succeeds Mr. Merkle as president. Mr. Merkle has been associated with the company for over 40 years, while Mr. Kirchhof joined the organization in 1937. Franklin Balmar is a supplier of devices and parts to the railroad and aircraft industries and also operates a contract facility for foundry and machine shop work. In addition, the firm manufactures and markets the Strand line of flexible shaft machines through its N. A. Strand Division.

★ ★ ★

**DREIS & KRUMP ANNOUNCES
EXTENDED PAYMENT
AND LEASE PLANS**

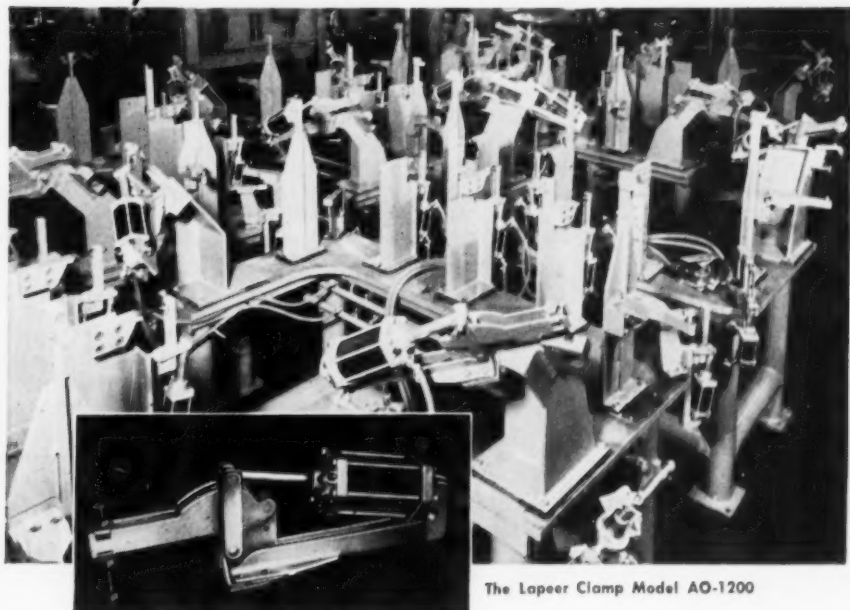
Dreis & Krump Mfg. Co., Chicago 36, Ill., has announced extended payment and lease plans which are now available for purchasing or leasing the complete line of "Chicago" press brakes, SS presses and power bending brakes. An option of four extended payment plans is available, with small down payment and the balance in monthly payments over one, two, three or four years depending on the plan selected. There are four lease plans, with or without option to buy, each extending over a term of nine years.

★ ★ ★

**ACME INDUSTRIAL ACQUIRES
ADDITIONAL PLANT SPACE**

Acme Industrial Co., Chicago, Ill., has announced that its recent acquisition of an additional 38,000 square feet of adjoining floor space has been re-modeled to suit their particular manu-

Spot Welded **IN 60 SECONDS!**



The Lapeer Clamp Model AO-1200

Truck cowl and plenum assemblies for a leading automotive manufacturer are placed into position, clamped, and spot welded in 60 seconds by one operator as a result of these fixtures engineered by the Martin Electric Co., Detroit.

Important to the production record of this installation is the air-operated, toggle-action clamp made by Lapeer . . . 7 on each fixture. Because they go into action so quickly, they save operator time and fatigue. Because they hold the work so rigidly, the manufacturer attains new horizons in quality control.

It's entirely possible that you have a work-holding problem that will be quickly solved by Lapeer. Better write for information—today.

Manufacturers of a complete line of Stationary and Portable Clamps and Pliers. And send for this free catalog.

**KNU-VISE
PRODUCTS**

LAPEER MANUFACTURING CO.

3048 DAVISON ROAD

WESTERN DIVISION: 422 Magnolia, Glendale, California

LAPEER, MICHIGAN

•

CANADIAN DIVISION: Higginson Engr., Hamilton, Ontario

For more data circle 426 on Reader Service Card

Now.. for your convenience consumer net prices for SIMONDS grinding wheels

VITRIFIED AND SILICATE BONDED

| SIZES | PHI | CHI | DET | BOS | SF | SIZES | PHI | CHI | DET | BOS | SF |
|---------------------|-----|-----|-----|-----|----|--------------------------|-----|-----|-----|-----|----|
| 6x3/4 (Cont) | | | | | | 6x3/4/3/8 (Cont.) | | | | | |
| WA46-RB-V2 | 6 | | | | | WA60-R5-V1-1-8/4 F | 6 | | | | |
| WA46-RB-V2-1/2 F | 12 | | 12 | | | WA60-RB-V1 | 50 | | | | |
| WA46-RB-V1 | 18 | | 24 | | | WA60-RB-V1-1-4/4 F | 12 | | | | |
| WA46-RB-V1-1/2 F | 12 | | 12 | 2 | | WA60-RB-V2 | 12 | | | | |
| WA46-RB-V1-5/8 F | 25 | 8 | 18 | | | WA60-R5-V1-2-1/4 F | 12 | | | | |
| WA60-JB-V1 | 12 | | | | | | | | | | |
| WA60-JB-V1-1-1/4 F | 12 | | | | | | | | | | |
| WA60-JB-V1-1/2 F | 25 | | | | | | | | | | |
| WA60-JB-V2 | 12 | | | | | | | | | | |
| WA60-JB-V2-1/2 F | 50 | | | | | | | | | | |
| WA60-RB-V1 | | | | | | | | | | | |
| WA60-RB-V1-3/4 F | | | | | | | | | | | |
| WA60-RB-V2 | | | | | | | | | | | |
| WA60-RB-V2-1/2 F | | | | | | | | | | | |

| 1-4 | 1-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 |
|-------|------|------|------|------|------|-----|-----|
| 13.10 | 2.38 | 2.21 | 2.04 | 1.90 | 1.73 | | |

| 1-4 | 1-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 |
|-------|------|------|------|------|------|-----|-----|
| 18.24 | 2.49 | 2.31 | 2.14 | 1.99 | 1.82 | | |

| 1-4 | 1-2 | 2-3 | 2-4 | 2-5 | 2-6 | 2-7 | 2-8 |
|-------|------|------|------|------|------|-----|-----|
| 18.24 | 2.49 | 2.31 | 2.14 | 1.99 | 1.82 | | |

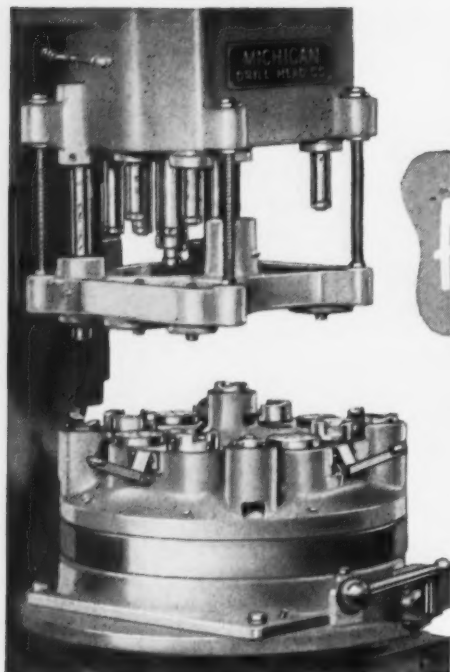
look
**HOW EASY
IT IS TO USE!**

Grinding wheel users will find this book a boon to the problems of grinding wheel pricing and delivery. Here, shown together for the first time, is complete availability of all the stock items of Simonds Grinding Wheels and Consumer Net Price per wheel in every ordering quantity.

SEND FOR YOUR COPY
SIMONDS ABRASIVE COMPANY • PHILADELPHIA 37, PA.

Branch Warehouses: Boston, Detroit, Chicago, Portland, San Francisco • Distributors in Principal Cities
Divisions of Simonds Saw and Steel Co., Pittsburg, Mass. • Other Simonds Companies: Simonds Steel Mills, Lehigh, N.Y.
Simonds Canada Saw Co., Ltd., Montreal, Quebec, U.S. Grinding Wheels Div., Bradville, Ont. and
Simonds Canada Abrasive Co., Ltd., Arvida, Quebec

For more data circle 427 on Reader Service Card



You can do

AMAZING

THINGS

on a small
drill press

YES

you can drill, ream and finish bore pressure plates for hydraulic pumps, on the drill press pictured above.

Here's a nine spindle drill head bushing plate and fixture and, a four-station hand operated index table—mounted on a Michigan Hydro 3 Drill Press. It's really amazing!

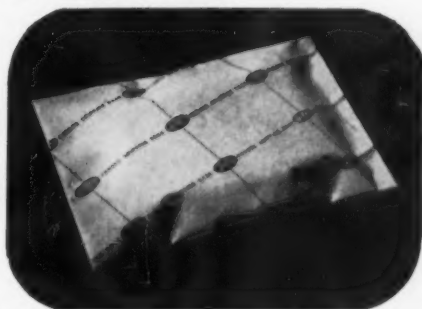
We also invite your inquiries as to our line of tapping units, and index tables—both manual and automatic—catalog sent on request.

Michigan

DRILL HEAD CO. Detroit 34, Michigan
engineers and manufacturers of production machines and drilling equipment

For more data circle 428 on Reader Service Card

WRITE FOR FREE SAMPLES
of
JIFFY PADDED
SHIPPING BAGS



- You've got to see how easy it is to pack for shipment in a Jiffy Bag.
- You've got to feel the thick cushioning of a Jiffy Bag to realize how well it protects your product in shipment.
- You've got to compare the time it takes to pack in a Jiffy Bag with your present packing method.
- You've got to analyze the cost of using Jiffy Bag and the other packaging materials.
- You've got to translate into dollars and cents the savings in time, labor and material to see how economical it is to use Jiffy Bags.

To do all this—you must have a Jiffy Bag to make your own test shipment.

SEND FOR FREE SAMPLES TODAY!

JIFFY MANUFACTURING COMPANY

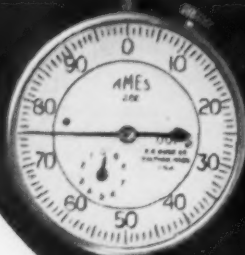
373 FLORENCE AVENUE

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HILLSDALE, N. J.

For more data circle 429 on Reader Service Card

AMES



...the preferred
Dial Indicators

Over 16,000,000 cycles
without wear or loss of accuracy ...
how many more will they complete?

Several Ames Model 282 Long Range Dial Indicators *with plain bearings* are currently giving an amazing demonstration of performance and endurance under test conditions. After more than 16,000,000 cycles each, at 240 strokes per minute, 9 hours a day—they still have their original accuracy!

The reasons for this outstanding record? Simply high quality materials, simple basic design, rugged construction ... and expert craftsmanship.

If you would like to have our recommendations on your measurement problem, send blueprints and specifications. And ask for your free copy of our catalog on Ames micrometer dial indicators and gauges.



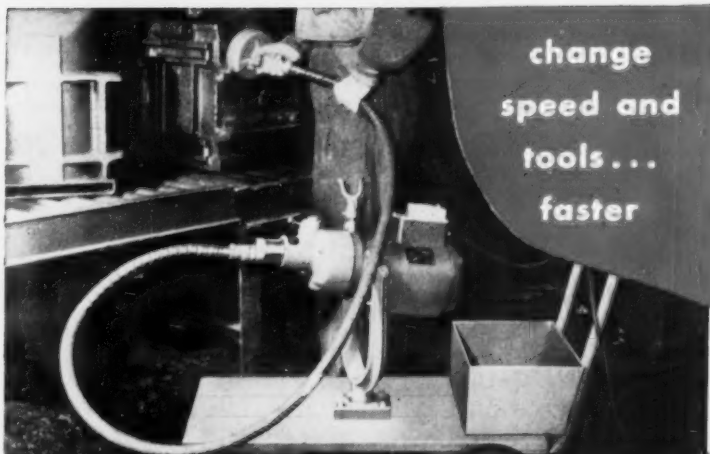
Representatives in
principal cities.

B. C. AMES CO.

29 Ames Street
Waltham 54, Mass.

Mfg. of Micrometer Dial Gauges • Micrometer Dial Indicators

For more data circle 430 on Reader Service Card



change
speed and
tools...
faster

with exclusive *Strandflex* 4 & 5 speed
GEAR DRIVE FLEXIBLE SHAFT MACHINES

ONE COMPACT UNIT gives you gear-shift selection of any of 4 or 5 speeds ranging up to 12,000 RPM... plus push-button tool changes. You cut machinery costs by putting a single power source to work for **GRINDING, ROTARY FILING, BRUSHING, SANDING, DRILLING, POLISHING, BUFFING, CLEANING.**

4 AND 5-SPEED STRANDFLEX GEAR DRIVES provide faster speed selection by eliminating countershafts, drive belts and pulley changes. You change speeds by little more than a flick of a finger... no need to use tools. Wider speed range lets you use Strandflex for more jobs, too.

QUICK-CHANGE COUPLING lets you change tools with a simple PRESS-PULL-SNAP action without using wrenches. Strand shafts and attachments are designed for tough use, even in hard-to-get-at jobs as well as production work.

FROM JOB TO JOB, the power source is easily moved on one of a wide variety of portable mountings. In use the operator lifts only the lightweight handpiece, not the heavy motor... thus reducing fatigue and increasing production.

NEW CATALOG describes **FULL LINE** of Strand Flexible Shaft Machines, including direct drive and countershaft models with up to 3 HP; also accessories and tools. See your Distributor or write direct for Catalog C-210B.



For more data circle 431 on Reader Service Card

new shop equipment

*Descriptions of new machines, tools
and materials for the metalworking
industry*

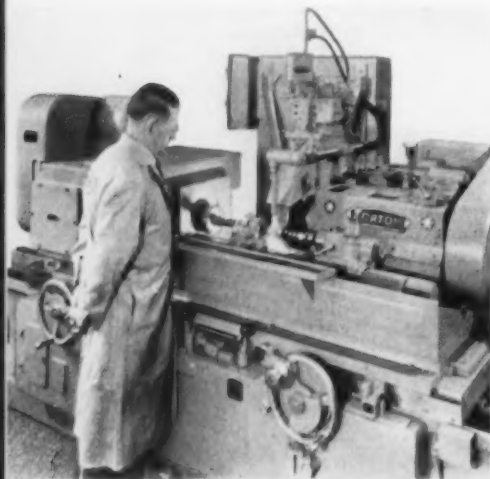
IMPROVED AUTOMATIC GRINDER FOR AUTOMOTIVE-TYPE CAMSHAFTS

Designated as the No. 3 "Cam-O-Matic," an improved precision automatic cam grinder has been announced by Norton Co., Worcester 6, Mass. According to the manufacturer, fastest grinding of automotive-type camshafts with better finish and simpler and sturdier construction details are among the improvements over the firm's for-

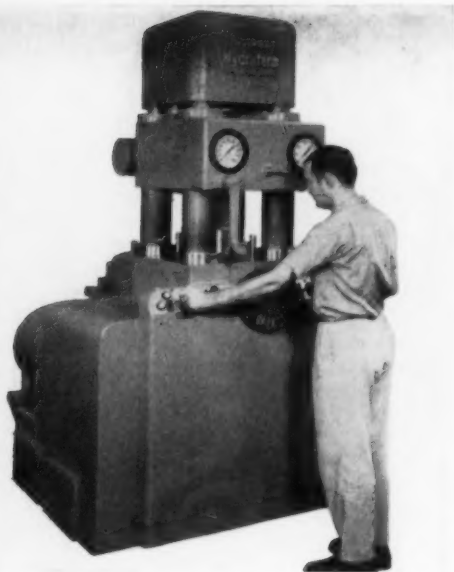
mer models. One of the features which contribute to better cam form and finish is the positive work drive. The use of a Gilmer timing belt is said to produce smooth work rotation by eliminating slippage and, at the same time, require less power.

The machine has two automatically controlled work speeds. The higher speed is adjusted for optimum rate of stock removal. The slow speed is the ideal rate for the best accuracy of contour and fine finish. The change from the fast to the slow speed is automatic, and its timing can be easily adjusted by a simple setting of a small lever on the wheel feed mechanism. The grinding action has been improved through the use of a heavier one-piece rocking bar of substantially increased cross-sectional area. A tapered roller bearing supports the center of the rocking bar. This increased rigidity, combined with heavier sliding and swivel tables of the machine, are said to permit heavier wheel feeds and more accurate contours.

Another feature of the grinder is automatic wheel guard truing. The truing cycle commences automatically after the last cam or eccentric has been ground, regardless of the angle of the wheel slide. Since the truing mechanism is built into the wheel guard, there is no swiveling of the wheel head prior to truing when grinding tapered cams. Automatic compen-



Norton No. 3 "Cam-O-Matic" Improved Automatic Cam Grinder for automotive camshafts



Cincinnati 8-Inch Hydroform Machine which is designed for producing a variety of small size, deep drawn and formed parts

sation for wheel wear is built into the machine. Other improvements include simplified electric and hydraulic controls for maximum ease in maintenance.

For more data circle 85 on Reader Service Card

★ ★ ★

8-INCH HYDROFORM MACHINE PRODUCES VARIETY OF SMALL PARTS

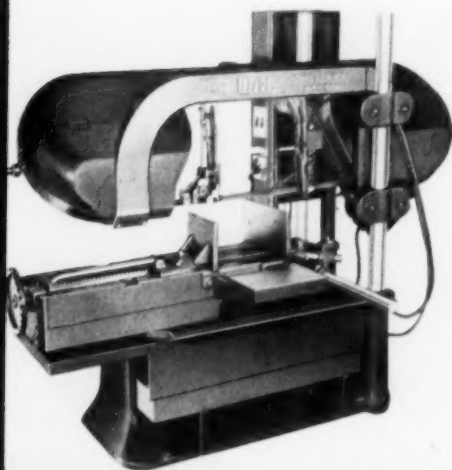
The Process Machinery Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio, has announced the 8-Inch Hydroform which is designed to produce a variety of small size, deep drawn and formed parts. Hydroforming embodies the use of a male punch and a flexible die member backed up by hydraulic oil pressure which may be accurately controlled up to 15,000 p.s.i. The 8-inch machine, it is claimed, will form parts from sheet metal blanks up to 8 inches in diameter with a maximum draw depth of 5 inches. Practically all sheet metals in gauges up to $\frac{1}{4}$ inch steel can be drawn. The maximum machine operating rate is 200 cycles per hour. The machine is self contained and floor mounted, measures 5 x 5 x 7½ feet high, weighs 12,000 pounds and requires only water and electrical connections to be put into operation.

For more data circle 86 on Reader Service Card

★ ★ ★

HEAVY-DUTY METAL-CUTTING BAND SAW IS HYDRAULICALLY OPERATED

The development of a heavy-duty, hydraulically operated, metal-cutting band saw, designated as the Model 1200, has been announced by Wells Mfg. Corp., 808 Tyler St., Three Rivers, Mich. Design features of the machine include an electrical system providing overload and low voltage



Wells Model 1200 Heavy-Duty Hydraulically Operated Metal-Cutting Band Saw



18 - 4 - 1 Steel

STUB REAMERS

in decimal sizes

For Screw Machines, Turret lathes and Drill Presses are the precise answer to all your special reaming problems. They are ground with **perfect accuracy** and backed-off to width of land and angle for the material to be reamed; Thus, tailor-made SUPEREAM STUB REAMERS mean extraordinary production efficiency and economy.

WRITE FOR INVENTORY STOCK LIST! Why buy a Decimal reamer as a SPECIAL — when you can buy the SUPEREAM DECIMAL REAMERS from stock for immediate delivery.

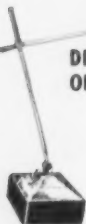
WRITE FOR BULLETIN #15



DIRECTS A BEAM OF WHITE LIGHT ON YOUR CLOSE PRECISION WORK

Write for Bulletin #30

Created by a tool & die maker, who discovered so many practical applications for this special-light. Particularly for close precision work. Increases efficiency—avoids eye-strain.



in emergency

phone: LIBERTYVILLE 2-4200

**TWENTIETH CENTURY
MANUFACTURING CO.**

ROUTE 176 and BRADLEY ROAD
Box 429-M LIBERTYVILLE, ILL.



For more data circle 432 on Reader Service Card

new shop equipment . . .

protection and 110 volts at controls for maximum safety; push buttons and other controls located at convenient height for operating ease; blade pressure controls with a wide range of uniform feeding pressures; automatic cutting cycle; special chip flushing unit; heavy-duty adjustable blade guides; "fool-proof" blade tensioning device; adjustable stops for die block depth cutting; and rigid positive stock stop.

The saw has a capacity of 12 $\frac{3}{4}$ inches for rounds and 12 x 6 inches and 11 x 18 inches for rectangular shapes. Driven by a 1-h.p. motor, the blade (13 feet 6 inches x 1 inch x 0.035 inch) can be operated at selective speeds for 60, 115, 200 or 300 feet per minute. Base area of the machine is 28 x 48 inches and overall size is 44 x 78 x 60 inches. The distance from the floor to the top of the bed is 24 $\frac{1}{4}$ inches.

For more data circle 87 on Reader Service Card

★ ★ ★

SYNTHETIC CUTTING FLUID FOR MACHINING TITANIUM

Carbide and Carbon Chemicals Co., Division of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y., has announced Ucon Cutting Fluid H-660 which is designed to increase tool life in machining titanium. According to the manufacturer, the fluid forms a clear solution with all proportions of water at room temperature, and its true water solubility permits unusual visibility of the work being cut, formed or ground. The cutting fluid can be completely removed with a cold water rinse. It can also be vaporized in heat treating operations. The synthetic fluid, it is claimed, has been particularly effective in many machining, cutting, forming and grinding op-

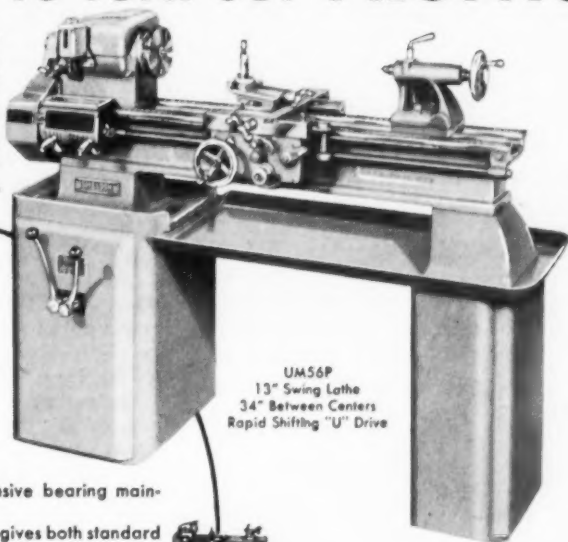
SHELDON

CHICAGO U. S. A.

BUILT

• • • to Turn out **PROFITS**

Sheldon Lathes are designed and built to do accurate lathe work rapidly and profitably. Moderate in price they have the collet, swing and power capacity to do most toolroom work.



UM56P
13" Swing Lathe
34" Between Centers
Rapid Shifting "U" Drive

Design

Features:

- Large and wide "Zero Precision" Tapered Roller Spindle Bearings—permit operation at all speeds, retain accuracy, and expensive bearing maintenance costs.
- 54-pitch Gear Box—gives both standard and many hard to get thread ratios.
- Large Micrometer Dials—Make accurate operation easier.
- Extra Collet Capacity—1 3/4" hole through spindles available on 10", 11" and 13" swing lathes.
- More Power to Spindle—Efficient drives with bigger motors and double neoprene cog V-belts to spindle.

OPTIONAL FEATURES AT EXTRA COST

include: Hardened ways, Long Tapered Key Drive Spindles, 4" D1 Camlock Spindles bed turrets, collet attachments, and other production and toolroom accessories. Lathes available with a choice of "Bench," "Cabinet" or "Pedestal" mountings.

Write for New Catalog G-55

SHELDON MACHINE CO., Inc.

4250 N. Knox Ave.

Chicago 41, Illinois

For more data circle 433 on Reader Service Card

June, 1955

modern machine shop 229



new shop equipment . . .

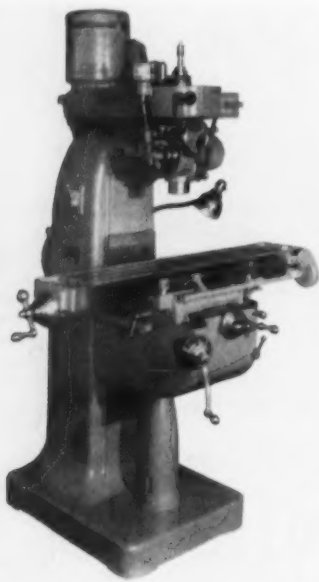
erations on carbon steels, stainless, chrome-molybdenum and vanadium steels and Nitralloy. Non-ferrous alloys workable with the fluid include Inconel, Monel, aluminum and its alloys, phosphor bronze, beryllium copper, silicon brass, Stellite alloy No. 3 and Hastelloy alloys B, C and D.

For more data circle 88 on Reader Service Card

★ ★ ★

IMPROVED MILLING MACHINE FEATURES HEAVY-DUTY MOTOR

The Index Machine Co., 544 N. Mechanic St., Jackson, Mich., has announced the improved Super 55 Vertical Milling Machine which is said to



Index Improved Super 55 Vertical Miller

afford power, capacity, weight and rigidity for boring, milling and drilling operations.

The improved machine utilizes a 1½-h.p., or optional 2-h.p., head with a heavy-duty motor providing 50 per cent or more capacity than previously available. The increased horsepower and dynamically balanced cast iron pulleys and drive system make possible improved production capacity. The flywheel effect of cast iron pulleys is claimed to greatly increase the rigidity of the spindle.

An improved system of table gibs is said to allow the table clamping mechanism to be brought to the front side of the saddle and still retain the advantage of having the rod trays adjacent to the fixed table slideway. Newly designed spindle brake increases productivity. More weight in the column, heavier ribbed column, heavier knee and heavier saddle are a few of the additional outstanding features of the machine.

The capacity of the milling machine is ⅜ to 1½ inches in tool steel and 2 inches or more in milder steels or cast iron. The table is available in two sizes; namely, 40 x 9 inches or 46 x 9 inches.

For more data circle 89 on Reader Service Card

★ ★ ★

PUNCH PRESS UTILIZES SOLID, ONE-PIECE CRANKSHAFT AND LARGE DIAMETER PIN

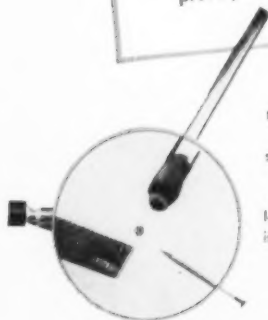
Designated as the Model 15, a 15-ton punch press which features a solid one-piece, alloy steel crankshaft, heat treated and precision ground, and a pin diameter of 2⅜ inches has been announced by Kenco Mfg. Co., 5211-A Telegraph Rd., Los Angeles 22, Calif. The flywheel is carried on two roller bearings, measures 20 inches in diameter and weighs 200 pounds—sufficient weight for full capacity punching



PRECISION GEARS

YOU who use small gears, (to 6" O.D. of the gear blank) can improve the performance of your product, through increased gear precision, without sacrifice of gear production.

YOU who use small, fine pitch, precision gears can increase your gear production without sacrifice of gear accuracy, or improve your gear accuracy without sacrifice of gear production.



The Hamilton Precision Gear Hobber, the hobber with a "reserve of accuracy," regularly holds work spindle and hob spindle runout to less than .0002", workspindle and tailstock spindle alignment to less than .0002", and this workmanship is maintained throughout the machine.



WANT FACTS?

Write for Bulletin No. 5419.
Address The Hamilton Tool Company
828 South Ninth Street,
Hamilton, Ohio.

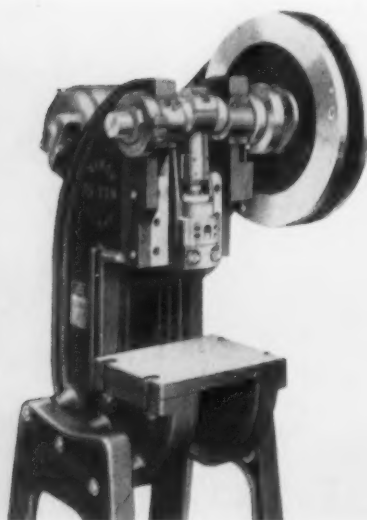


IT'S A

Hamilton Tool
USE IT WITH CONFIDENCE

For more data circle 434 on Reader Service Card

new shop equipment . . .



Kenco Model 15 15-Ton Punch Press

at both high and low speeds. Extra long, V-type ramways are designed to give precision guidance throughout most of the ram travel distance.

According to the manufacturer, both the ramway and the press frame are made of sorbomat castings to afford high tensile strength and rigidity. The ram hole is $1\frac{1}{8}$ inches, accommodating standard die sets. The ram area, front to back and right to left, is 4 x 5 inches. The distance from the center of the ram to the back of the press is 6 inches, and the bolster plate area measures 11 x 14 inches.

The driving mechanism is contained in the clutch collar and requires no slots in the crankshaft. To ensure positive long-wearing drive, the flywheel is fitted with a companion drive which is heat treated and precision ground. The press is equipped with a single-trip control which is said to provide

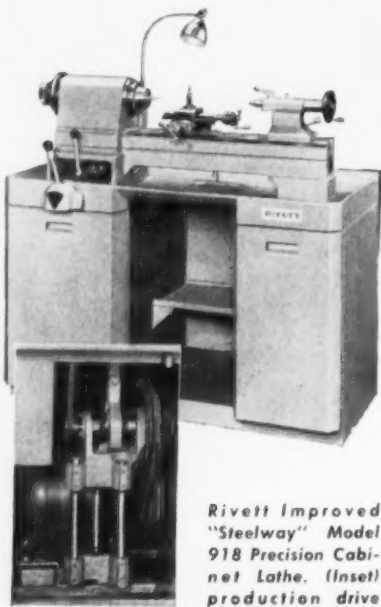
safe, positive single-trip action and require only 1 to 2 pounds operating pressure. The press can be furnished with single or double-hand control or with foot control.

For more data circle 90 on Reader Service Card

★ ★ ★

IMPROVED CABINET LATHE HAS EITHER PRODUCTION OR VARIABLE DRIVE

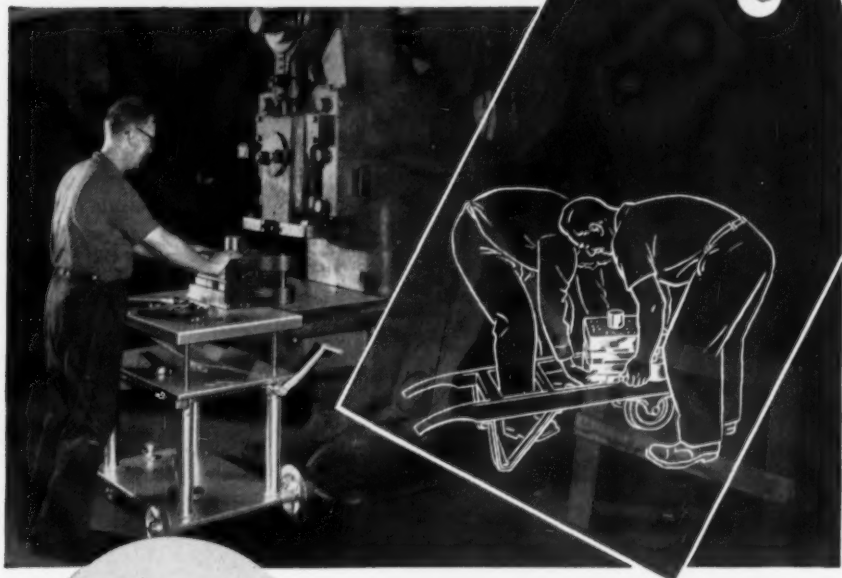
Designated as the "Steelway" Model 918, an improved 9-inch swing precision cabinet lathe which features the option of a production drive, permitting one-operator motion for multiple functions, and a variable drive, for instant selection of any speed from 90 to 3,750 r.p.m., has been announced by Rivett Lathe and Grinder, Inc., Dept. MMR, Brighton 35, Boston, Mass. Ease of operation is said to be obtained by improved work-holding methods



Rivett Improved "Steelway" Model 918 Precision Cabinet Lathe. (Inset) production drive

BRAWN

YOUR PRODUCT'S MOST EXPENSIVE FACTOR



Of all that contributes to the production of your product, labor is the most costly.

Of all that contributes to the reduction of costs, a simple mechanical means for handling compact, heavy loads is the least costly, easiest to install, most widely used by workers.

Complete

information in FREE
Bulletin No. P-5404.

Write for it! Address
The Hamilton Tool Company,
828 South Ninth Street
Hamilton, Ohio

PORTELVATOR®

THE HANDY HAMILTON PORTABLE ELEVATING TABLE

FITS THAT NEED

Built standard to handle loads of 1000 to 5000 pounds, Portelvator features the original worm, worm gear, and screw principle of power transmission, plus three table surfaces, plus four point support.

Prices start at \$155.00—Install a couple without delay, and watch results.



IT'S A

Hamilton Tool

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For more data circle 435 on Reader Service Card

new shop equipment . . .

and well-grouped controls for operator efficiency, greater capacity and higher precision. A lever chuck closer reduces effort to a minimum; 1½-inch capacity draw-in collets mount directly in spindle mouth; stationary collets have no "in" or "out" motion; and step chucks provide accurate holding of circular or irregular parts.

Other features of the machine include double-beyel steel ways; self-aligning slide rest which squares itself automatically with line of centers; an endless V-belt which can be easily replaced without disturbing headstock and drive; headstock spindle which revolves on two super-precision, preloaded ball bearings; and a wide spac-

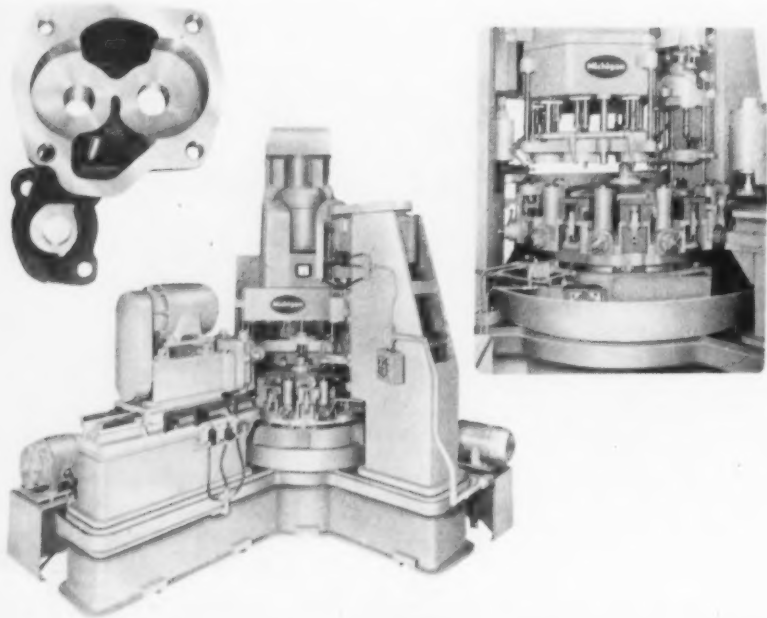
ing of 7¼ inches on ball centers which diffuses heat of end-thrust preload and distributes radial load.

For more data circle 91 on Reader Service Card

★ ★ ★

**SPECIAL MACHINES COMBINE
TO COMPLETELY PROCESS OIL
PUMP BODIES**

Michigan Drill Head Co., Detroit 34, Mich., has designed and built a production "team" consisting of two fully automatic machines which completely finish 120 cast iron oil pump bodies every hour ready for assembly. The following operations are performed on Machine No. 1: rough mill the top face of the pump body; finish mill the top face; drill through the 0.4845 hole, and tap drill two mounting holes;



Michigan Drill Head's production "team" consisting of two fully automatic machines

IT'S A HAMILTON



INDEED

There is no way under the sun to do small, precision tapping with "production" speed, satisfactory tap life and acceptable accuracy, other than to use a tool designed for the specific purpose.

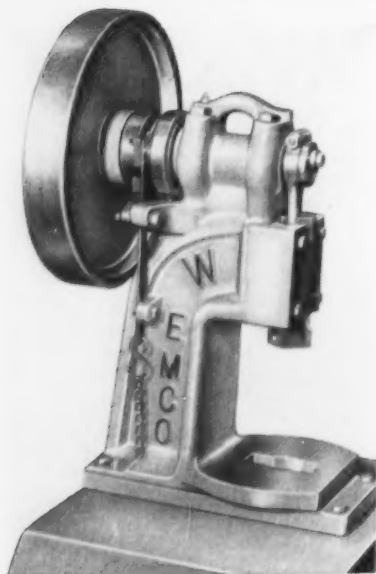
**THE *Hamilton* SUPER-SENSITIVE
SMALL HOLE TAPPING MACHINE
IS SUCH A TOOL!**

WANT ALL THE FACTS

Write for Hamilton Bulletin No. 5203.
Address The Hamilton Tool Company,
828 South Ninth Street, Hamilton, Ohio.



For more data circle 436 on Reader Service Card



EMCO "W", bench type, 5-ton; also larger EMCO "X", 10-ton. Both sizes also stand-mounted. With or without motor drive.

EMCO POWER PUNCH PRESSES

are **SPEEDY** and **SAFE**

Versatile EMCO presses excel for punching, forming, stenciling and riveting metal, leather, plastics and other non-metallic materials. Up to 300 operations per minute. "Big machine" speed, strength, rigidity, accuracy, endurance. Compact, fool-proof; simple design—easy to operate. Thousands of EMCOS in money-making use testify to Klaas' dependability since 1921.

Ask for our Bulletin "S-6".

UNUSUAL
AIDS
TO
INDUSTRY

**THE KLAAS MACHINE
& MFG. CO.**

4334 East 49th St.
Cleveland 25, Ohio

KLAAS-BUILT

For more data circle 437 on Reader Service Card

new shop equipment . . .

drill through the 0.4785 hole, and tap drill two mounting holes; chamfer the 0.4845 hole, chamfer the first two mounting holes, and rough bore one gear pocket; chamfer the 0.4785 hole, chamfer the other two mounting holes, and rough bore the other gear pocket; finish bore and square bottom of one gear pocket; finish bore and square bottom of the other gear pocket; tap all four mounting holes in top face; finish ream the 0.4845 hole; and finish ream the 0.4785 hole.

These operations are performed on Machine No. 2: straddle mill the outside lower face and inside lower face; finish mill the outside lower face; drill two 0.2491 mounting holes; drill through the 15/32 hole; finish ream the two 0.2491 mounting holes; drill the 7/16 hole half way through; and drill the 7/16 hole through. Both machines are built around standard Michigan hydraulic multiple drilling machines.

According to the manufacturer, smooth operation is assured at all stations inasmuch as hydraulically operated index tables are used on both machines. The milling heads are mounted on standard hydraulic way type units. Ways are hardened and ground, and automatic lubrication is provided throughout.

For more data circle 92 on Reader Service Card

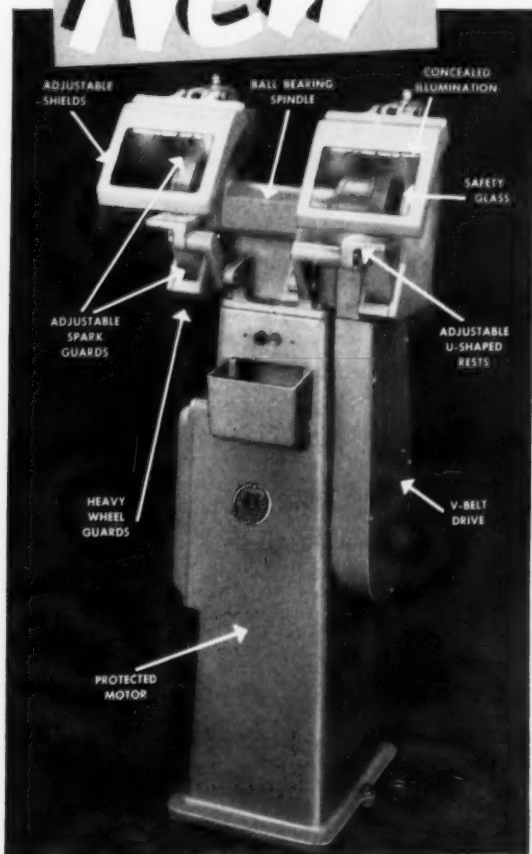
★ ★ ★

AUTOMATIC SELF-CLEANING FILTERING UNIT USES PERMANENT FILTER MEDIA

Industrial Filtration Co., Dept. U-294, Lebanon, Ind., has introduced the Delpark "Up-Flo" Filter, an automatic, self-cleaning unit which filters fine, as well as coarse, particles from liquids through a permanent filter

New

SOUTH BEND PEDESTAL GRINDER



A ruggedly built grinder that will give long, dependable service under hard use. Ideal for rough or precision grinding. The motor is enclosed in the pedestal and drives through a V-belt. This removes the weight of the grinding wheels from the motor bearings and practically eliminates vibration. Moreover, it isolates the motor from abrasive dust and provides greater work clearance. Send coupon for complete information on this better-built grinder.

SPECIFICATIONS

Wheel Size: 8" dia. ($\frac{1}{2}$ h.p. motor), 10" dia. ($\frac{3}{4}$ h.p. motor).

Spindle: Approx. speed 2450 r.p.m. Sealed ball bearings.

Motor: Standard 2875 r.p.m. 50 cycle or 3450 r.p.m. 60 cycle. Also D.C.

Over-all Dimensions: 49 $\frac{1}{2}$ " high, 18" wide, 20 $\frac{1}{2}$ " deep (10" Grinder $\frac{1}{2}$ " wider).

8"—\$245, 10"—\$248, each less motor and remote control equipment. Convenient time payment terms. Only $\frac{3}{4}\%$ annual interest on original unpaid balance.

Compared with our costs
OUR PRICES ARE LOWER
than they were back in 1941



Prices are closely tied to costs. Costs are still rising. Buy now before increased costs necessitate higher prices.

SEND INFORMATION CHECKED:

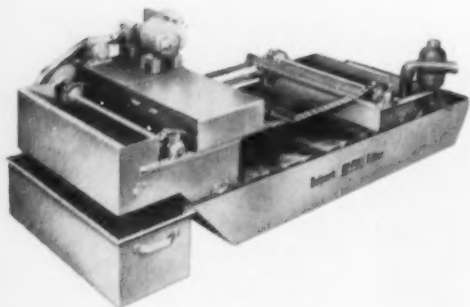
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|---|---|---|---|---|---|
|  |  |  |  |  |  |
| <input type="checkbox"/> 9" and 10" BENCH LATHES | <input type="checkbox"/> 10" to 16-24" FLOOR LATHES | <input type="checkbox"/> DRILL PRESSES | <input type="checkbox"/> TOOL GRINDERS | <input type="checkbox"/> $\frac{1}{2}$ " & 1" Collet TURRET LATHES | <input type="checkbox"/> 7" BENCH SHAPERS |

Name _____ Street _____
City _____ State _____

Building Better Tools Since 1906 • SOUTH BEND LATHE • South Bend 22, Indiana

For more data circle 438 on Reader Service Card

new shop equipment . . .



Delpark "Up-Flo" Self-Cleaning Filter

medium. The filter utilizes gravity to remove the heavier solids before filtration of the liquid through a horizontal bar-type screen. Only the fine particles held in suspension reach the screen.

According to the manufacturer, the efficiency of the filtration process is never impaired by deposits. Chain driven flights, operating on a time lapse sequence, pass under the filter and remove deposits from the underside of the screen and the area beneath the screen. These flights carry the particles to a device which cleans the flights. Filtered swarf drops into a tote box for disposal. The Delpark "Up-Flo" Filter is said to maintain high efficiency on high capacity and full flow. All sizes, flows and capacities are available.

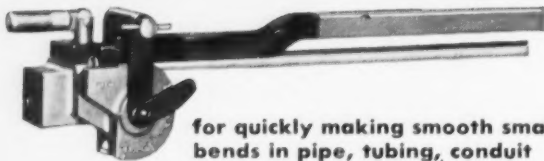
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★ ★ ★

MACHINES GRIND LARGE-DIAMETER GEARS AND SPLINES

Gear Grinding Machine Co., Detroit, Mich., has announced a 30-inch internal and a 36-inch external auto-

GREENLEE HAND BENDER



for quickly making smooth small-radius bends in pipe, tubing, conduit

Forming small-radius bends without flattening or kinks is simple, speedy work with a GREENLEE Hand Bender. Ideal in the shop for pipe and tubing installations on machines... especially designed to form neat bends for sharp corners, nooks and other close quarters. Various models and sizes for steel, copper, brass and aluminum tubing or pipe, rigid and thin-wall conduit



GET FREE FOLDER E-207 AND BOOKLET E-201. Complete facts and prices on the Greenlee Bender line. Write Greenlee Tool Company, 1986 Herbert Avenue, Rockford, Illinois.



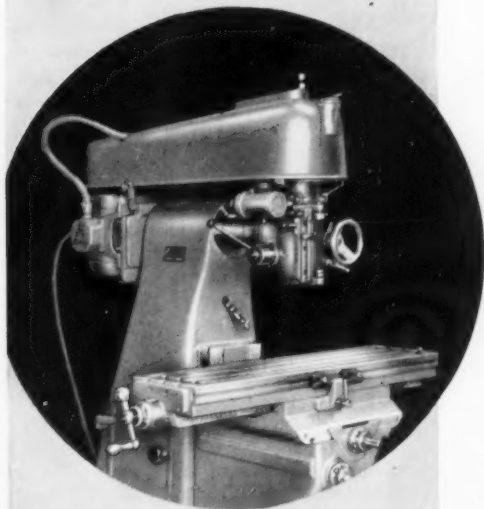
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does **MORE** work...
MORE easily

new POWER FEED HEAD

U. S. Vertical Miller



Write for descriptive folder

Here's the new U. S. Vertical Miller with Power Feed Head—the head into which U. S. has built all the most wanted features without sacrificing traditional U. S. simplicity. Check its infinitely variable feed rate, its 800 pounds of down thrust on the quill, its supplemental hand feeds—it is the milling head that was designed to meet all shop needs.

Add to these the basic advantages of the U. S. Vertical Miller. You can easily see why it's the milling machine that "does more work more easily."

Detailed literature on request. The U. S. Burke Machine Tool Division, 3 Brotherton Road, Cincinnati 27, Ohio.

more versatile

Feed infinitely variable from .002" to .005" while in operation

greater capacity

5½" power quill travel, 800 lb. down thrust

more convenient

Supplemental hand feeds

increased rigidity

Enclosed hard chrome plated quill with internal lock

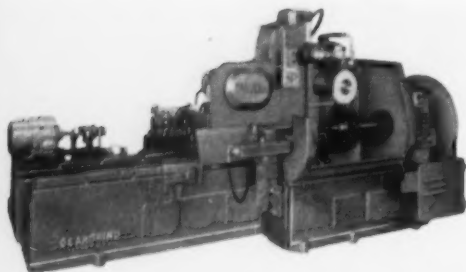
THE **U • S • Burke** MACHINE TOOL DIVISION

For more data circle 440 on Reader Service Card

June, 1955

modern machine shop 239

new shop equipment . . .



Geargrind 36-Inch External Gear Grinder

matic gear grinding machines for working on large-diameter gears, splines and specially contoured parts. According to the manufacturer, contributing factors to the versatility of the machines are the ease and speed of retool-

ing for another job, the only changes generally necessary being contour forms, index plates and holding fixtures or arbors. On each machine, it is claimed that the grinding wheel carriage speed, equipped with 6-inch face wheels, will make 55 cuts per minute.

Each machine utilizes a hollow workhead spindle. Developed for holding aircraft gearing away from the workhead, the spindle is unusually rigid, and heavy gears are said to be produced with a high degree of accuracy. For pieces too long for the centers, having 6 or 13-inch diameter holders, provision has been made for the workpiece to go completely through the workhead spindle. The tailstock has been designed to allow the use of pillow blocks in place of receding centers.

The workpiece is chucked at the workhead spindle and supported by a split pillow block at the tailstock. This arrangement allows shafts of consider-

STEEL
CHICAGO
PRESS
BRAKES

43 Standard Sizes

Readily adapted for a wide variety of bending, forming drawing, notching, blanking, punching, embossing, etc.

DIES Complete Line of Induction Hardened Dies for All Makes and Sizes of PRESS BRAKES.



4914

DREIS & KRUMP

MANUFACTURING COMPANY

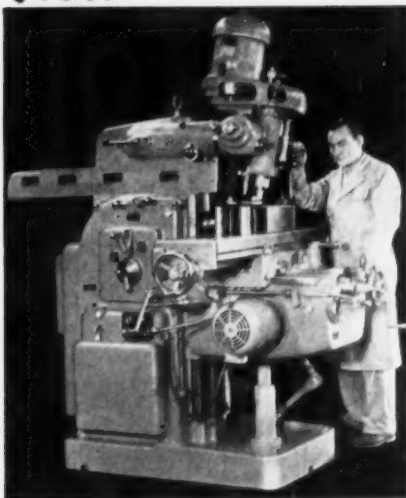
7418 S. Loomis Boulevard, Chicago 36, Illinois

CHICAGO

STEEL BENDING BRAKES
BOX AND PAN BRAKES
PRESS BRAKES

For more data circle 441 on Reader Service Card

New GORTON DOUBLE-DUTY MILL PROVIDES SPECIFIC ADVANTAGES



VERTICAL-ANGULAR MILLING

COMBINES RUGGED DESIGN,
TOP PERFORMANCE WITH
TOOL ROOM ACCURACY

For horizontal milling and
vertical or angular milling
without re-locating work

As a horizontal it does conventional and climb milling up to 2,000 R.P.M. As a vertical-universal, it does precision work up to 5,600 R.P.M.

COMPARE THESE FEATURES

Exclusive Gorton Receptor Ram increases capacity.

Available with 56" table (28" travel), 62" table (34" travel) or 76" table (48" travel).

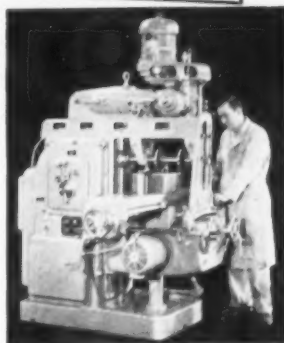
Interchangeable Assembly Unit Construction offers multiple advantages.

Horizontal spindle horsepower: 7½, 10 or 10 over 5. Super-speed belt-driven vertical spindle: 1½ over ¾ H. P.

Rigid support for work with 24½" bearing spread on knee and large square lock bearing guides.

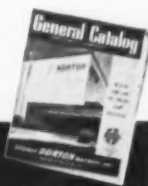
Exclusive removable coolant pan speeds sump cleanout and coolant interchange.

Mechanical and dual electrical overload protection for cutters and work.



HORIZONTAL MILLING

Write for
Complete
Catalog
1655-
1706.



GEORGE **GORTON** MACHINE CO.

1706 RACINE STREET

RACINE, WISCONSIN, U. S. A.

SINCE 1893

Tracer-Controlled Pantographs, Duplicators—standard and special... Horizontal and Vertical Mills, Swiss-Type Screw Machines, Tool Grinders, Small Tools and Accessories.

For more data circle 442 on Reader Service Card

A 8217-IPA

June, 1955

modern machine shop 241

new shop equipment . . .

ably long length to be accommodated by the machine. Selection of several different types of variable speed drives is provided. Where the system permits, optimum grinding wheel periphery speeds should be used. Should production not warrant the purchase of a large single-purpose internal gear

grinding machine, the external grinder can be equipped with either of two sizes of internal grinding attachments. For more data circle 94 on Reader Service Card

★ ★ ★

COLLET CHUCK IS BALL BEARING ACTUATED

Hancock Mfg. Co., Inc., Dept. X, Santa Clara, Calif., has announced an

improved ball bearing actuated "Chukollet" collet chuck which is designed to positively locate workpieces axially and radially to within 0.0005 inch even though the workpiece diameters may vary several thousandths. The improved chuck is supplied with an adjustable internal stop and can accurately hold short pieces, thin-walled cylindri-



DUSTKOP
STOPS DUST

**FASTER
INSTALLATION**

**LONGER
MACHINE LIFE**

**REDUCED
MAINTENANCE**

CONSERVES FLOOR SPACE

STOPS HEAT LOSS

LOWER FIRST COST

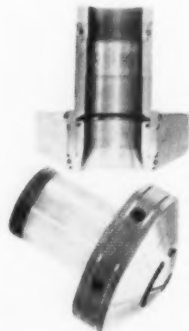
**DUST COLLECTORS
SAVES
6 WAYS**

Dust problems are stopped quickly, efficiently with Dustkop. Thirty-seven standard models available for immediate delivery. Write for descriptive literature.

AGET MANUFACTURING COMPANY

1398 EAST CHURCH ST., ADRIAN, MICHIGAN

For more data circle 443 on Reader Service Card

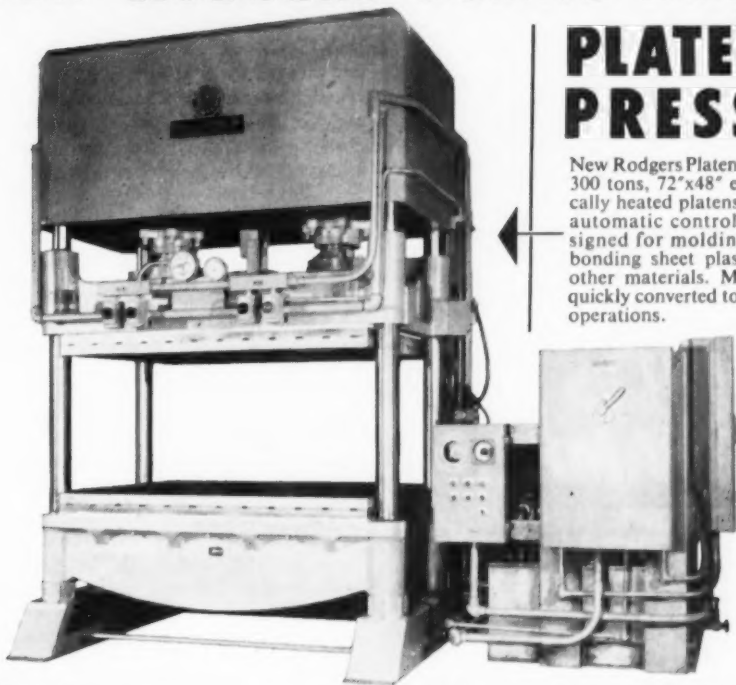


Hancock Improved
Ball-Bearing "Chukollet" Collet Chuck

New RODGERS "Double Duty"

PLATEN PRESS

New Rodgers Platen Press, 300 tons, 72"x48" electrically heated platens, with automatic controls, designed for molding and bonding sheet plastic to other materials. May be quickly converted to other operations.



1 forms or draws metals

2 molds and bonds plastics in ONE operating cycle

Are you processing both metals and plastics? This newest Rodgers Platen Press is quickly converted for metal or plastic operations—a "double feature" advantage that means equipment savings.

Heated platens, which mold sheet plastic *and* simultaneously bond it to metal, rubber or other materials, are interchangeable with metal forming or drawing dies. By using pneumatic die cushions, the press can be converted for deep drawing of metals.

Rodgers "Double Duty" Presses are available in 10 to 500-ton capacities and with platen sizes from 12"x12" to 72"x48". Precision control equipment automatically governs platen movement, pressure, time cycles and temperature. Operator safety is assured by equipment design.

MANUFACTURERS. If you're processing metals and plastics you'll be interested in this double duty press; let us send you more information and also a copy of our catalog describing other Rodgers "Blue Ribbon" Presses for plastic and rubber molding, metal drawing and metal forming.



Rodgers Hydraulic Inc.

7447 Walker St. • Minneapolis 16, Minn.

For more data circle 444 on Reader Service Card



new shop equipment . . .

cal parts and soft-threaded parts without damage. It can also be used to hold round, square and hexagonal workpieces for milling, slotting, drilling, tapping, counterboring and grinding.

The unit, it is claimed, can be quick-

ly mounted in any chuck on center, or it can be used for turning consistently accurate eccentric parts. By using a small V-block, the Chukollet may also be used in any machine vise. The chuck is made of alloy steel, hardened and finish-ground inside and out. According to the manufacturer, the anti-friction ball bearings provide maximum gripping power.

For more data circle 95 on Reader Service Card

RAYMAC *Solid Carbide* **DRILLS and REAMERS**

Raymac drills cut hardened metal . . . do not burn or anneal. Feature operational speeds of 350 to 600 RPMs depending on size and hardness of metal.

Raymac solid carbide reamers are custom designed for individual jobs.

Write for catalog No 12

RAYMAC

MANUFACTURING COMPANY INC.

3729 CASS AVENUE, DETROIT 1, MICH.

For more data circle 445 on Reader Service Card

★ ★ ★

FACE GRINDER HAS WORK SPINDLE IN HORIZONTAL PLANE

Designated as the No. 11, a face grinding machine which has the work spindle in a horizontal plane, permitting wide flexibility of work-holding devices, has been announced by Brown & Sharpe Mfg. Co., Providence 1, R. I. According to the manufacturer, the work rotating in a vertical plane results in easy cleaning of the work-holding surface, effective coolant application and unusually high surface quality of the work being ground. Grinding with the periphery of the wheel, the machine is claimed to efficiently produce accurate, flat surfaces on work up to 10 inches in diameter and up to 3 inches thick on a permanent magnet chuck. It is claimed that accurate concave or convex surfaces up to 10 degrees can be ground as easily as flat surfaces.

LUERS

PATENTED CUTTING OFF TOOL HOLDERS PATENTED CUTTING OFF BLADES

ONLY the PATENTED construction of LUERS cutting off BLADES permits normal expansion of bursting chips — MEANS MAXIMUM CUTTING EFFICIENCY.

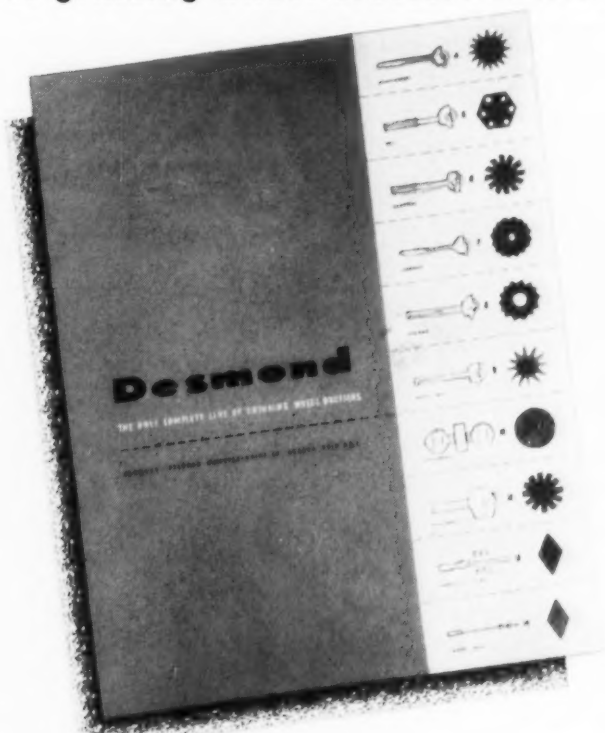
Manufactured by

J. MILTON LUERS, 12 Pine Street, Mt. Clemens, Mich.

Produced under License Issued by John Milton Luers Patents Inc.

For more data circle 446 on Reader Service Card

ANNOUNCING
DESMOND'S NEW CATALOG
of grinding wheel dressers & cutters



24 pages of information on dressing and truing your grinding wheels with a complete listing of all of Desmond's many types and sizes of dressers and cutters. A worthwhile reference catalog for all users of grinding wheels. Ask your Industrial Distributor for a copy of Desmond's catalog No. 75 or write to THE DESMOND STEPHAN MFG. CO., Urbana, Ohio.

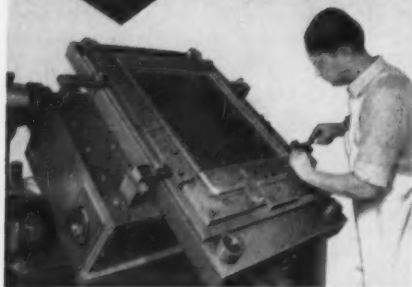
THE ONLY COMPLETE LINE OF GRINDING WHEEL DRESSERS AND CUTTERS

Desmond

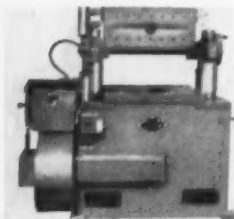
THE DESMOND-STEPHAN MFG. CO., URBANA, OHIO

For more data circle 447 on Reader Service Card

**The modern way to
tryout and finish dies
is the ALPHA way**

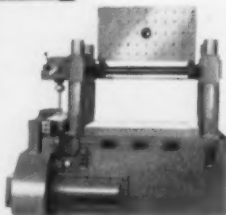


Barber, shear, fit and finish both die members without removing dies from the press. That is why you get faster, more economical production with Alpha Die Tryout Presses.



2 post press
50, 75, 100
tons

4 post press
100, 150,
200 tons



Full details in this free,
illustrated folder.

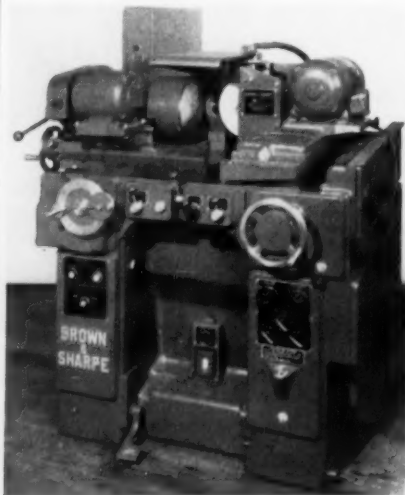
ALPHA
PRESS & MACHINE, INC.
9281 Freeland Ave., Detroit, 28, Mich.

For more data circle 448 on Reader Service Card

new shop equipment . . .

Wheel truing is by the set-diamond method. During the wheel truing operation, the relative position of the finished face of the workpiece to the diamond remains unchanged. It is claimed that the flexibility of work holding permits the use of a fast and efficient method for insertion and removal of work from the machine. The horizontal work spindle allows the use of lever-operated devices, such as the permanent magnet chuck or the face chuck.

The wheel slide grinding and truing speeds are readily selected and set, with a graduated dial indicating the rate in use at all times. This is equally true of the work feed. Automatic work feed can be set for the inside and outside reversal or the inside reversal only. Similarly, the dwells from 0 to 2½ seconds are independently variable at the inside or outside or both. All controls are conveniently grouped.

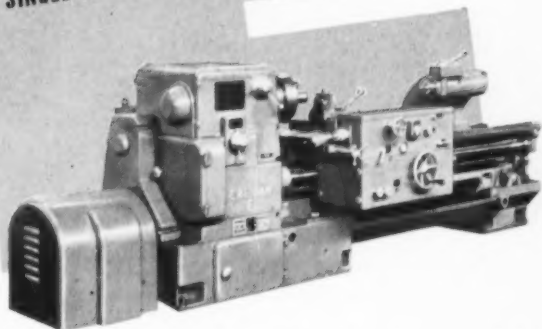


Brown & Sharpe Model No. 11 Face Grinder



**NEW HEAVY-WEIGHT
CHAMP**

CRI-DAN "E"
SINGLE POINT THREADING MACHINE



SPECIFICATIONS

Threading Range 2TPI-48TPI
Max. Thd. Dia. (Internal) . . 16" Dia.
Max. Thd. Dia. (External) . 12" Dia.
Max. Swing Over Ways . . . 25" Dia.
Max. Swing Over Tool Slide 12" Dia.
Max. Thread Length 6 1/2"
Max. Taper of Thds. 16° Included
Multi-Start Threads Yes
Spindle Speeds . . 50-1400 R. P. M.
Main Motor 20 HP
Floor Space Req'd . . 5'6" x 14'0"
Approx. Weight 4 1/2" Tons
Length Between Centers
66" Standard

The new CRI-DAN "E" is truly a heavy-weight champion when it comes to performance, versatility and capacity. Not only do you get High-speed threading but also built-in facilities for secondary turning, boring, facing and chamfering. Complete hydraulic and electric controls assure maximum efficiency even on heavy applications.

Write today for the full CRI-DAN "E" story on this new, heavy-weight champ that beats any other threading method.

CRI-DAN DIVISION

the **LEES-BRADNER**®
CLEVELAND 11, OHIO, U.S.A. *Company*

For more data circle 449 on Reader Service Card

new shop equipment . . .

A positive stop for both manual and power feed of the work head is provided. The machine also features choice of manual or semi-automatic control, accurate wheel spindle slide reversal, sealed lubricated spindles and automatic lubrication. A work feed hand-wheel power retraction arrangement

and an automatic cycle and spark-timing arrangement are available as optional equipment.

For more data circle 96 on Reader Service Card

★ ★ ★

UNIT COLLECTS FINE AND COARSE DUST PARTICLES

Designated as the Dustkop 5C20, a dust collecting unit which is designed

to eliminate the problems where fine and coarse dust must be simultaneously collected has been announced by Agat Mfg. Co., 1398 E. Church Street, Adrian, Michigan.

The dust collector combines a cloth bag and a mechanical pre-separator. It features a cloth filter bag of large filter area which traps

WORLD'S HARDEST METAL



BUSHINGS

BLADES

ROLLS

DIES

TOOLS

BAR STOCK

IMPROVED QUALITY

Additional refinements and improvements in our process have added still longer life to the wearing edges of Talide tools, dies and wear resistant parts. The result is a carbide having a new, unique grain structure with harder and tougher properties than previous grades. Laboratory tests reveal our improved grades possess 25% greater strength and rigidity. Service life per grind up to 50% longer than previous grades has been proven in grueling field tests.

METAL CARBIDES CORP.,
YOUNGSTOWN 7, OHIO

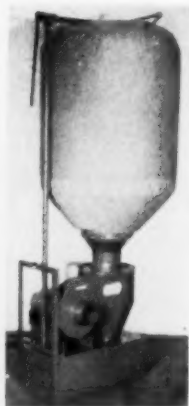
Write for Catalog 35-G

METAL CARBIDES CORPORATION

TALIDE®

YOUNGSTOWN 7, OHIO

HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • CERMETS • HIGH TEMPERATURE ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY



Agat Dustkop 5C20
Dust Collecting Unit

For more data circle 450 on Reader Service Card

NEW

A BIG ADVANCE IN BELT SANDERS

WALLS

TU-WAY BELT SANDER



HORIZONTAL



VERTICAL

USE IT
EITHER WAY

It takes the leader to show the way! The new WALLS 'TU-WAY' BELT SANDER offers all the most wanted features yet sells for such a low price. It's a rugged industrial sander of top quality throughout. Try it—see if you don't agree that it's the BIGGEST SANDER VALUE YET!

WALLS TU-WAY BELT SANDER

Complete with cord, plug
and "on-off" switch . . .
ready to plug in and use.
Only

\$89.95

*Illustrated
Literature
on Request*

Check These WALLS TU-WAY Advantages:

- ✓ Instantly adjustable from horizontal to vertical and back again. Simply loosen one nut. No time lost.
- ✓ Swift action thumb screw for instant belt adjustment.
- ✓ Extra fast, easy belt changing.
- ✓ Balanced aluminum pulleys for smoother operation and longer life.
- ✓ Full 1/2 h.p. G. E. motor.
- ✓ Permanently sealed bearings require no lubrication.
- ✓ Outboard bearing arm takes up overhang on drive pulley.
- ✓ Center leg eliminates strain in horizontal position.
- ✓ Large work table with mitre gauge slot for use in vertical position . . . available at slight additional cost.

A few desirable distributor territories still available.

WALLS SALES CORPORATION

333 NASSAU AVENUE
BROOKLYN 22, N. Y.

For more data circle 451 on Reader Service Card

new shop equipment . . .

the fine dust not separated from the air stream by the centrifugal action of the cyclone separator. A single upright supports the filter bag for easy installation in the field, and a shaker handle imparts a snapping action to both sides of the cloth filter bag for effective removal of dust from the inside surface.

Fine dust then falls freely into a single dust bin with the coarse dust, contributing to simple "one action" emptying.

For more data circle 97 on Reader Service Card

★ ★ ★

PRECISION INSTRUMENT FOR DIMENSIONAL MEASUREMENTS

C. E. Johansson Gage Co., Division
of Swedish Gage Co., 10641 Haggerty

Ave., Box 4086
Northeastern Station, Dearborn 1, Mich., has announced the Mikrokator No. 500-502, a precision instrument for dimensional measurements. The instrument is provided with a mechanical, frictionless amplification device without sliding bearings or gears. There is claimed to be no play, wear or binding. The purpose of the instrument is to give accurate measure-

Drill Hardened Steels without Annealing -



With the new, improved "HARDSTEEL" Drill, you can do accurate, smooth drilling, countersinking, counter-boring and reaming in steels hardened by any process without first annealing the work. And they work with equal ease on work-hardening steels and high carbon-high chrome steels of any degree of hardness.

"HARDSTEEL" Drills fit standard drill presses. They save time and reduce rejects. They permit engineering changes requiring additional drilling after hardening. And parts drilled after hardening always match at assembly.

Write for a copy of the "HARDSTEEL" Operators Manual showing how "HARDSTEEL" drills are cutting costs in thousands of plants.

**You Harden It—We'll Drill It—
With "HARDSTEEL"**

BLACK DRILL COMPANY, INC.

1372 East 222nd St. • Cleveland 17, Ohio

Also makers of—
**BLACK DRILLING
UNITS—AUTOMATIC,
SELF-CONTAINED—
FOR COST-CUTTING
PRODUCTION ON
ALL MATERIALS**

Write for information



Johansson No. 500-
502 Mikrokator Gage

For more data circle 452 on Reader Service Card

MID-WEST

Tool grinding wheels



IT'S A FACT!

Tool Room Wheels made with Mid-West's exclusive S11A grit (developed and produced in Mid-West's own Abrasive Grain Plant) more than likely can perform your tough tool grinding operations more efficiently and more economically. Yet, S11A is not a premium priced abrasive grain.

A FACT THAT CAN BE PROVED!

For in the tool rooms of Mid-West customers all over the country, S11A wheels, combined with Mid-West's exclusive vitrified bonds have been tested time and time again with these results: Operating costs were cut, while grinding efficiency increased!

Check with your nearest Mid-West representative today for detailed information related to your particular operation, or, write direct to:

MID-WEST ABRASIVE CO.

EXECUTIVE OFFICES:

510 S. WASHINGTON ST., OWOSSO, MICHIGAN

PLANTS:

OWOSSO, MICHIGAN AND
ROCHESTER, PENNSYLVANIA

For more data circle 453 on Reader Service Card

new shop equipment . . .

ments both in mass production checking and in checking individual parts. The instrument is made in three different designs and in both inch and millimeter calibrated models.

Extra accessories, one fixed and one adjustable back, are available for the

MICRO-HEIGHT GAUGE

BY FAIRFIELD GAUGE CO.



**NO OTHER GAUGE
COMPARES FOR
FAST, ACCURATE
LAYOUT AND
MEASURING**

Capacities to
6" when used
with this
Fairfield Gauge
3" Riser

The Micro-Height Gauge is a precision instrument, finished in satin chrome, which reads like a micrometer and measures from zero at base to 3" in thousandths. Use as a scribe for fast layout, or insert dial indicator for quick, accurate inspection.

FAIRFIELD GAUGE COMPANY

172 Herbert Street
BRIDGEPORT 6, CONN.

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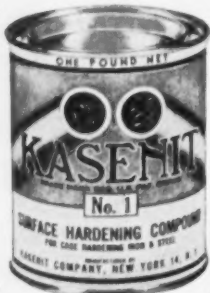
instrument. Irrespective of the adjustable back being used, the zero setting of the instrument is facilitated with a zero-setting device. If the measuring point supplied is too short, it can be exchanged for longer points without affecting the stability of the instrument. The instrument is provided with two adjustable tolerance pointers which can be easily mounted and removed. The measuring pressure of the instrument is approximately $3\frac{1}{2}$ ounces, and the weight of the unit is about $6\frac{1}{2}$ ounces. According to the manufacturer, accuracy of the instrument is plus or minus 1 per cent over the entire scale range.

For more data circle 98 on Reader Service Card

★ ★ ★

FIXTURE FOR RESHARPENING RIGHT OR LEFT-HAND TAPS

Identified as the "Rocket", a tap sharpening fixture which is said to make it possible to resharpen either right or left-hand taps of two, three or four flutes in approximately three minutes has been announced by Rockford Die & Tool Works, Inc., 1816 Seventeenth Ave., Rockford, Ill. The unit can be used on any make or any size grinder with a magnetic chuck. The fixture is equipped with one $\frac{1}{2}$ -inch collet and will accommodate any standard 5-C collet of $\frac{1}{8}$ to 1-inch capacity. The first liner sleeve is off



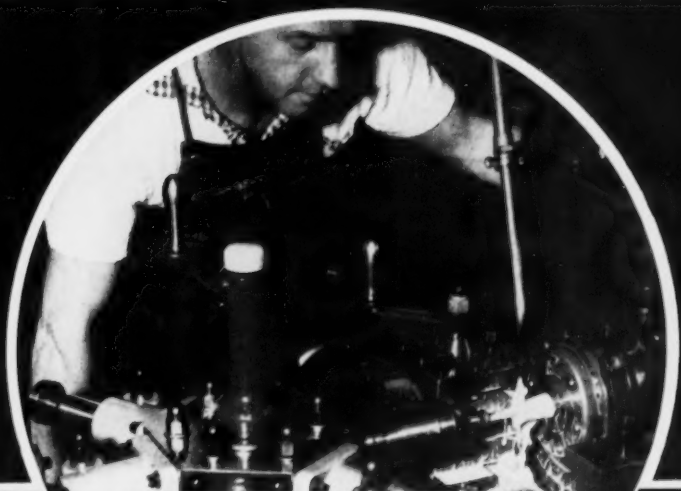
SPEEDY and SAFE CASE HARDENING WITH NO SPECIAL EQUIPMENT

Indispensable for Machine Shops, Schools, Tool Rooms, Etc.
1 lb., 5 lb., 10 lb., 25 lb., 50 lb., 100 lb. containers.

KASENIT COMPANY

799 GREENWICH STREET BOX G NEW YORK 14, N. Y.

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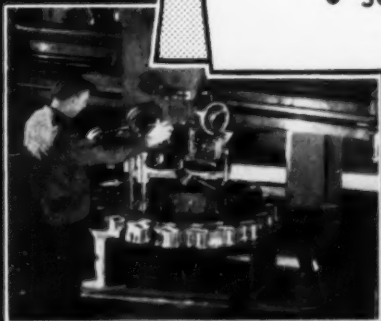
THE
WORLD'S
MOST
VERSATILE
TAPPING
ATTACHMENTS

TAP WITH TAPMATIC

on your . . .

- TURRET LATHES
- SCREW MACHINES
- RADIAL DRILLS

COMPLETE
RANGE OF
SIZES
FROM
#0 — 2"



TAPPING WITH TAPMATIC RESULTS IN SAVINGS TO YOU!

TAPMATIC

C O R P O R A T I O N

845 West 16th Street • Costa Mesa, California • Phone Liberty 8-3404

For more data circle 456 on Reader Service Card

new shop equipment . . .

center to cut radial clearance on the tap. The second liner sleeve is on dead center for indexing purposes. Sleeves are made of carburized and hardened steel, the base is of cast iron, and there is a holder for a steadyrest finger. The

CAMS

Fully equipped modern machine shop with extensive Jig Boring, Surface Grinding, Horizontal Boring and Thread Grinding facilities as well as modern Cam Milling and Cam Grinding equipment.


Your Inquiries Answered Promptly

HIMOFF MACHINE CO., INC.

23-16 44th Road Long Island City 1, N. Y.

For more data circle 457 on Reader Service Card

Micro
Supreme
**LAY-OUT AND
IDENTIFICATION DYE**



7 COLORS

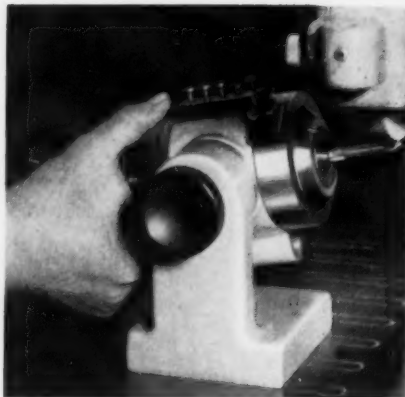
For Tool, Die, Pattern or Template layout on metal . . . Quick identification of bar stock, sheets, strips or parts . . . Shows up in sharp relief—dries instantly . . . Write for sample and circular on company letterhead.

**MICHIGAN CHROME &
CHEMICAL COMPANY**

8615 Grinnell Ave. • Detroit 13, Mich.

For more data circle 458 on Reader Service Card

254 modern machine shop



Rockford "Rocket" Tap Sharpening Fixture

sharpening fixture measures 6 x 6 x 7 inches and has an attractive hammer-oid finish.

For more data circle 99 on Reader Service Card

★ ★ ★

SHAPER HANDLES GEARS UP TO 20 INCHES IN DIAMETER

Michigan Tool Co., 7171 E. McNichols Rd., Detroit, Mich., has announced a Shear-Speed Shaper designed for the high production cutting of gears and toothed parts. The machine, available in two models designated as the Nos. 18136 and 18206, is capable of handling gears ranging up to 20 inches

LW **MAGNETIC CHUCKS**
As Low as

\$55.37



Demagnetizers as low as \$27.50.

Send for free catalog on magnetic chucks, vises, power hack saws and dividing heads.

L-W CHUCK COMPANY
28 SO. ST. CLAIR STREET TOLEDO 4, OHIO

For more data circle 459 on Reader Service Card

June, 1955

Only 7" high,
OMNI-VISE is lowest
in the trade.

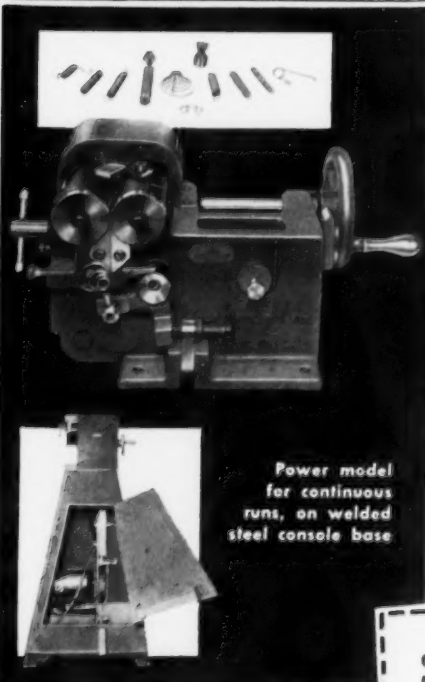


Hold any machine work at any EXACT angle with sturdy OMNI-VISE!

Accurately set in all three planes in only 15 seconds, this sturdy precision vise made in two capacities saves time and headaches for progressive shop operators and pays for itself quickly. Only 7" high (lowest in the trade), OMNI-VISE #4, shown at top, is tough, weighs 74 lbs. Jaws are 4" x 1 1/2", open to 4". Base is 9" in diameter with one side straight. Inset shows OMNI-VISE #2, a precision low-priced vise. Users find it exceptional for grinding compound angles on carbide tools. Weight, 16 lbs. Height, 4 3/4". Jaws, 2 1/4". Opening, 2 1/8". Base, 7 1/4" x 5". For grinding, drilling or general work at any angle, by hand or machine, an OMNI-VISE is the machinist's choice.

Make any type spring, without arbors, FAST with Perkins Spring Coiler!

When you need a replacement or experimental spring, any shape, diameter or pitch from flat or round wire sizes .005" to .125", you can produce it in a matter of seconds with the new Perkins Precision Spring Coiler! You entirely eliminate the use of arbors, yet turn out precision springs — torsion, compression, extension tapered, or special springs — coiled either left or right hand, in any desired length, any diameter from 1/16" to 12" and larger, with or without initial tension, and with open or closed ends. Eliminate expensive special orders and costly production delays! Make your own springs to exact specifications for replacements or experimental work. Make them fast right in your own shop!



Power model
for continuous
runs, on welded
steel console base

EXCLUSIVE DISTRIBUTORS OF
PRECISION MACHINE
TOOLS

**Connors and Davis
Sales Corporation**

CONNORS AND DAVIS Sales Corp.
506 Circuit Ave., West Springfield, Mass.

Please send detailed information and
prices on:

PERKINS SPRING COILER

hand ☐ power ☐

OMNI-VISE #4 ☐ #2 ☐

Name _____ Title _____

Company _____

Address _____ State _____

City _____

Keep a Close Check On Accuracy With **SUNDSTRAND** Bench Centers



Simplify assembly, lower spoilage and get better production from this modern Sundstrand Bench Center. You'll check work between centers easier, faster and within limits of .0001" on this improved Sundstrand Bench Center.

"One-hand control" over all movable elements leaves the operator's other hand free to control rotation of the part being checked. Either headstock or tailstock can be unclamped, positioned and locked in place with a single hand operating the top lever. Investigate this bench center today.

Complete Range as Follows:

| | | |
|-----------|-----------|-----------|
| 6" x 18" | 12" x 48" | 24" x 48" |
| 6" x 36" | 12" x 60" | 24" x 60" |
| 12" x 36" | 12" x 72" | 24" x 72" |

FREE Additional Data

covering complete specifications and additional features is contained in this bulletin. Write for your copy. Ask for data sheet 557.



SUNDSTRAND MACHINE TOOL CO.
2539 Eleventh Street, Rockford, Ill., U.S.A.

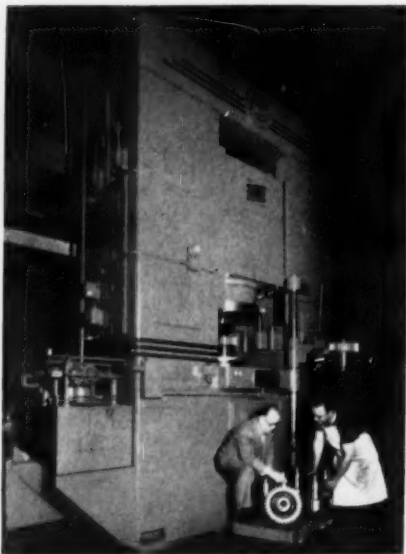
For more data circle 461 on Reader Service Card

256 modern machine shop

new shop equipment . . .

in diameter and up to 6-inch face width. Since the machine cuts all teeth of a gear or external contours simultaneously, it is said to be capable of forming splines, ratchets, clutches, cams, and so on, rapidly and efficiently. Even though the machine weighs over 44 tons and is more than 17 feet high, it is claimed to have features that make tooling setups, maintenance and operation a one-man job. One such feature is the automatic hydraulic positioning hoist which is used to swing the cutting head into position for mounting in the machine and which also is used to load and unload part blanks that weigh up to several hundred pounds.

Because of the high production rate and the size of the parts to be produced, a chip conveyor is built into the



Inspecting the first gears produced on the giant Michigan Shear-Speed 18136 Shaper

June, 1955

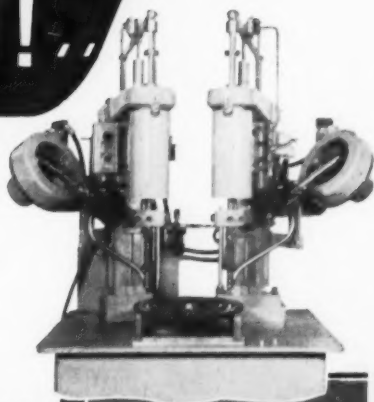
Dependability! **P**recision! **S**peed!

Three Important
Production Factors
Presented by the

DPS LINE OF ASSEMBLING EQUIPMENT

● Do you have a feeding or assembly problem? Remember that DPS stands for equipment that will bring you greater earnings, lower costs and on-time schedules . . . A complete line of modern power-driven machines that assures performance in keeping with the increased tempo of present-day production.

Give Us Your Problem—Send Sample Assembly—
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**POWER
SCREWDRIVING
MACHINES**

●
**SELECTIVE
PARTS FEEDERS**

●
**SPECIAL
ASSEMBLY
MACHINES**

DETROIT POWER SCREWDRIVER CO.

2807 W. FORT ST.

DETROIT 16, MICH.

For more data circle 462 on Reader Service Card

June, 1955

modern machine shop 257

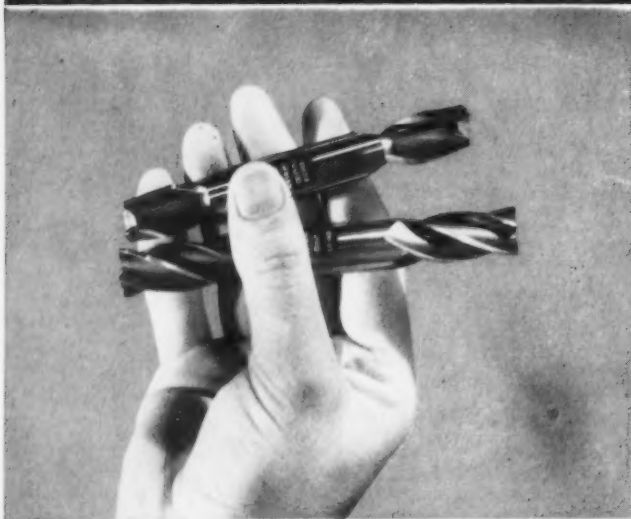
new shop equipment . . .

machine to carry away the large volume of metal chips removed from a part in one production cycle. Large volume coolant flow is directed not only to keep the cutting tools cool, but also to wash all chips away from the part fixture onto the conveyor as fast as they are produced. Three automatic

pressure lubricating systems feed a continuous flow of oil to all moving parts. One network lubricates all the working components of the head, such as cams, shafts, bearing surfaces, and so on. Another keeps the Two Cone Drive gear sets in the drive section oiled. The third system lubricates the moving components of the reciprocating work ram — the connecting rod, wrist pin, bearings, and so on. A special detecting system warning bell notifies the operator if the vital ram section is not receiving the proper lubrication.

Either hydraulic or pneumatic automatic clamping fixtures can be used on the machine. Operation of the clamping fixture is tied into the completely automatic machining cycle. Cutting heads for the machine are readily interchangeable to accommodate different part sizes and shapes. The stroke of the reciprocating work ram is adjustable to the face widths of the gears being cut. Other advantages of the shaper include low tooling costs per unit produced and minimum floor space requirements. Complete tool changeovers (cutting head, lo-

YESTERDAY'S PIONEER . . . TODAY'S LEADER



WELDON Double-End End Mills FOR DOUBLE DUTY

Weldon Double-End End Mills originally developed by Weldon give you double the service for much less than the cost of two single end mills of equal size. They save production time, too, because to change the

mill you simply turn it end for end. Weldon leadership in the cutting tool field has been achieved by many original features which contribute to faster, better performance and longer tool life.

Weldon distributors throughout U.S.A. and Canada carry complete stocks to serve you.

THE WELDON TOOL COMPANY



3000 WOODHILL ROAD . . . CLEVELAND 4, OHIO

For more data circle 463 on Reader Service Card

ERCO AUTOMATIC DRILL RIVETERS

*handle heavier materials faster...
at lower cost!*

Like the well known ERCO Automatic Punch Riveters which boost production as much as 400% and cut labor costs up to 80%, the *Drill Riveters* offer great savings on riveting jobs that are beyond punching range thickness. Air gapped work combinations unsuited to punch riveting are easily handled by drill riveting.

Because they combine four operations in one continuous cycle, ERCO Automatic Drill Riveters perform at rates far surpassing other methods now in use. These operations are:

1. Drilling up to $\frac{1}{4}$ " diameter holes in $\frac{1}{2}$ " maximum combined material thickness.
2. Drill countersinking for flush riveting.
3. Automatically feeding rivet.
4. Heading rivet.

VERSATILITY . . . another plus!

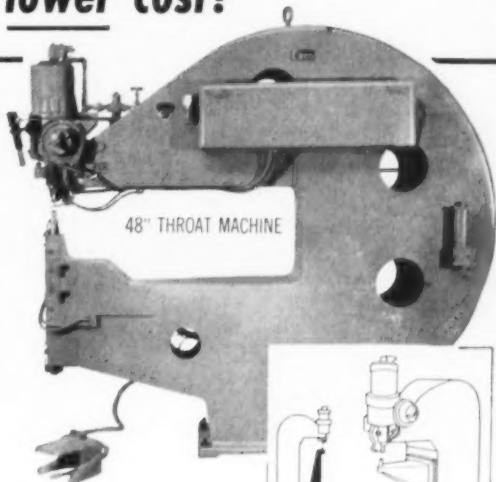
These machines can handle all types of solid or tubular rivets from $\frac{3}{32}$ " to $\frac{1}{4}$ " diameter, for drill riveting in aluminum, copper, brass, steel, plastic, fiber and wood. If you have a special fastening problem, ERCO's experienced staff will analyze it and adapt a machine to it.

For complete information, write:

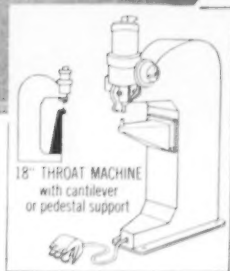
ENGINEERING and RESEARCH

A DIVISION OF **acf INDUSTRIES**
INCORPORATED

RIVERDALE, MARYLAND



48" THROAT MACHINE



18" THROAT MACHINE
with cantilever
or pedestal support



Flush riveting solid rivet in solid work



Plain riveting solid rivet in solid work



Plain riveting tubular rivet in work with air gap

For more data circle 464 on Reader Service Card

new shop equipment . . .

cating and clamping fixture) can be accomplished in from 25 to 45 minutes, making it practical to operate the large machine on a job shop basis while producing a variety of parts. All critical surfaces of each cutting tool are said to be ground to unusually close tolerances. Tools are form relieved so that sharpening on an ordinary surface

grinder maintains the accuracy of the form throughout the entire life of the tools.

For more data circle 100 on Reader Service Card

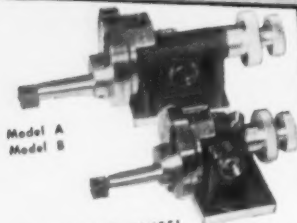
★ ★ ★

LATHE HAS VARIABLE SPEED DRIVE

Identified as the No. 6560, a lathe with variable speed drive having a range of from 38 to 1,200 r.p.m. has been announced by Logan Engineering Co., Lawrence and Lamon Ave., Chicago 30, Ill. Principal specifications of the machine are 14 $\frac{3}{4}$ -inch swing over the bed, 9-inch swing over the saddle, 1 $\frac{3}{8}$ -inch spindle hole, 1 inch collet capacity and 40 inches between centers. The lathe is designed for toolroom, production and maintenance work.

According to the manufacturer, the machine is of rugged, precision construction throughout. The headstock is extra heavy, and machine cut gears are extra wide. The massively proportioned spindle of hardened and ground 52100 steel turns on two double rows of

Improve Your Operating Efficiency, Quality and Profits with these LAST WORD Metal-Working Products!

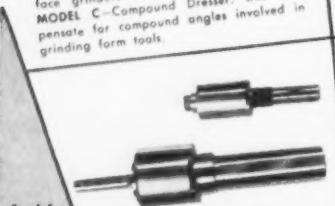


Model A
Model B

LAST WORD WHEEL DRESSERS FOR RADIUS AND TANGENT ANGLE DRESSING—AVAILABLE IN 3 MODELS MODEL A—For grinders using wheels up to 20" dia MODEL B—For small model surface grinders with 7" max wheel dia MODEL C—Compound Dresser, will compensate for compound angles involved in grinding form tools.



SAMSON "Heavy-Duty" OFFSET BORING CHUCK—Has positive centering feature for drilling and milling operations. Complete accessories available.



Send for
complete
data

GRAY-GRIMES FLOATING DRIVER—For reaming, tapping, valve seating and similar operations. Can be supplied with standard or special shanks and adapters.



GRAY-GRIMES AUTOMATIC STEADY-REST FOR O.D. GRINDING—Permits grinding complete length of shaft maintaining constant pressure against work piece as stock is removed.

Mfg'd by
Gray-Grimes Tool Co.

LAST WORD sales company

18500 MT. ELLIOTT (Dept. B) • DETROIT 34, MICH

For more data circle 465 on Reader Service Card



ask your
Bunting
distributor...

**... for the finest bearing
bronze available from stock**

Bunting Bronze Bearings and Bars are made of a special Bronze alloy developed in Bunting metallurgical laboratories through study of innumerable bearing applications and many rigid tests. Known as Bunting No. 72 bearing bronze alloy (SAE 660) this Bronze embodies superlative anti-friction properties together with easy machineability and long life.

Bunting®

BRONZE BEARINGS • BUSHINGS • PRECISION BRONZE BARS
THE BUNTING BRASS AND BRONZE COMPANY
TOLEDO 1, OHIO
BRANCHES IN PRINCIPAL CITIES

For more data circle 466 on Reader Service Card

HE HAS IT

Your Bunting Distributor carries in stock completely machined and finished Bunting Standard Stock Industrial Bearings, Electric Motor Bearings and Precision Bronze Bars in a complete range of sizes, meeting all your usual production and maintenance needs. You will find him listed in the classified section of your telephone book—most likely under the heading Bars, Bronze or Bearings, Bronze. He is an industrial distributor or a specialist in certain industrial items. Ask him for the Bunting Catalog or write.



new shop equipment . . .

oversize ball bearings. The special alloy bed is 68 inches long and 10 inches wide, its deep and rugged walls well braced by oversize ribs. The two V-ways and two flat ways are precision ground. The heavy, precision carriage with double-walled apron and disc-



COLLET EQUIPMENT

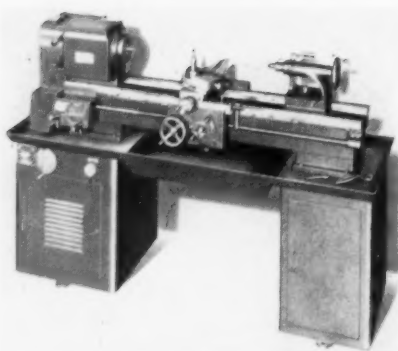
Use-Em-Up Type Drill Sleeves
Use-Em-Up Type Drill Sockets
Standard Type Drill Sleeves
Standard Type Drill Sockets
Short Shank Type Sleeves
Short Shank Type Sockets
B. & S. Taper to B. & S. Taper Sleeves
B. & S. Taper to Standard Taper Sleeves
Standard Taper to B. & S. Taper Sleeves
Rough Shank Sockets
Solid Type Sockets
Morse Taper Shank Tap Sockets
Standard Spot Facing Cutter Bars
High Speed Point Lathe Centers
Carbon Steel Lathe Centers
Pipe Centers for Lathes
Lathe Bushings
Blank End Arbors
Chuck Arbors
Drill Drifts
Magic Type Chucks and Collets

Standard tools for all drilling, reaming, and tapping needs and special tools to order. Immediate attention to regular or special requirements.

THE COLLIS COMPANY
CLINTON, IOWA

Dept. A

For more data circle 467 on Reader Service Card



Logan No. 6560 Toolroom and Production Lathe

type clutch is said to combine convenience, rigidity, accuracy and durability. To further assure maximum smoothness and accuracy, the entire lathe and 2-h.p. motor are dynamically balanced as a complete unit before being crated for shipment.

For more data circle 101 on Reader Service Card

★ ★ ★

3/4-INCH SQUARE DRIVE HEAVY-DUTY RATCHET HEAD

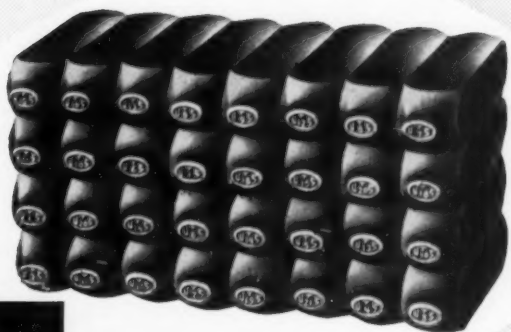
J. H. Williams & Co., 408 Vulcan St., Buffalo 7, N. Y., has announced the addition of a 3/4-inch square drive heavy-duty ratchet head to its detachable socket line. The heavy-duty ratchet head is drop forged from selected



DRILL THESE HOLES
BY A QUICK, EASY, INEXPENSIVE METHOD
Your business letterhead will bring literature.

WATTS BROS. TOOL WORKS
Wilmerding, Pa.

For more data circle 468 on Reader Service Card



RETAIN CONTROL

with INSPECTION and CODE STAMPS



These inspection and code stamps enable a manufacturer to retain control of his product wherever it goes. A single glance can provide such information as the identity of a welder, inspector, operator, or assembler—heat number, lot number, material or date of manufacture.

Choose your own code from any of 300 stock designs, available in any desired size, in either the economical HI-DUTY Brand or even longer-lasting HI-LOY Brand. You'll get permanent identification through use of code designs, with key letters or figures if desired.

"IF IT'S WORTH MAKING, IT'S WORTH MARKING"...

Geo. T. Schmidt marking engineers will help you develop a code control plan without obligation. Write for particulars.

GEO. T. SCHMIDT, INC.

1806 West Belle Plaine Avenue

Chicago 13, Illinois



For more data circle 469 on Reader Service Card

For Arbor Spacers and Shims,
Feeler Stock or Shim Stock...

specify top-quality



**ARBOR SPACERS
AND SHIMS**

20 arbor sizes $\frac{3}{8}$ "
to 4" ... 19 thick-
nesses .001" to .125"

Specify with or without keyways. Also avail-
able—hardened and ground spacing collars
(with standard keyway) $\frac{1}{8}$ " to 3" long in all
popular sizes. (For use in milling, slitting
and gang-saw setups, shimming gears and
bearings.)

FEELER STOCK

Made from tem-
pered stock, rolled
to close tolerances.
 $\frac{1}{8}$ " x 25' coils
packaged in trans-
parent plastic boxes, except above .020".
Strips $\frac{1}{8}$ " x 12", in cellophane. 27 thick-
nesses. All thicknesses from .001" to .032".
(For use in precision fitting, checking clear-
ances, inspection and production work.)



SHIM STOCK

Selected from mate-
rial rolled to precision
limits, free from burrs,
and protected by oil
coating. Coils packed in
carton for easy dispensing
and protection. 15 thicknesses .001" to .032".
Sheets 6" x 12"; coils 6" x 120". Available also
in assortment package of 12 thicknesses
.001" to .015".

For details and prices,
write for descriptive literature.



Detroit Stamping Co.

349 MIDLAND AVE. • DETROIT 3, MICH.

For more data circle 470 on Reader Service Card

new shop equipment . . .



Williams $\frac{3}{4}$ -Inch Square Drive Heavy-Duty
Ratchet showing knurled and plain handles

alloy steel, fully heat treated for added
strength and finished in satin chrome
plate. Its heavy-duty ratchet gear has
24 teeth to provide for quick, smooth
action. A shift lever on the head re-
verses ratchet action instantly.

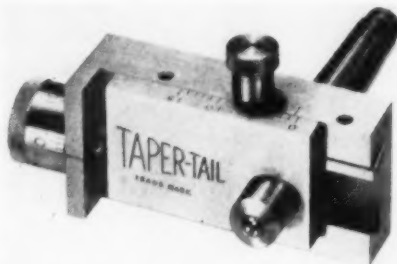
A choice of two handles is available;
namely, plain or with knurled handle
grip. A length of 20 inches for either
handle is said to offer more than ade-
quate leverage for the rugged ratchet
head.

For more data circle 102 on Reader Service Card

★ ★ ★

**LATHE TAILSTOCK ATTACHMENT
ENABLES CUTTING OF TAPERS**

Designated as the "Taper-Tail," a
lathe tailstock attachment which is



Fitzer "Taper-Tail" Lathe Tailstock Attachment

Introducing the World Famous

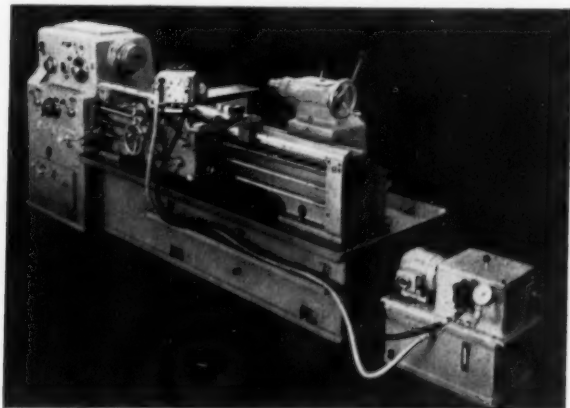
WEISSER HEILBRONN

High Speed LATHE in the United States

Represented By

WEISSER MACHINERY CORPORATION

for the Sale and Service of these noted Precision Lathes



GOLIATH

High Speed Lathe

Simplified speed adjustment.
Completely sealed Gear Box.
All parts submerged in oil.
Slanted Lathe Bed.

**Parts and Service for
the GOLIATH High
Speed Lathes avail-
able on short notice
at our Linden office.
Telephone Linden
3-9110.**

Special Offer to Dealers

We wish to establish a wide Dealership contact at once throughout the United States. Choice territory is now open to responsible machinery sales organizations. Write immediately for further details.

WEISSER MACHINERY CORPORATION

**ENGINE LATHES • TOOL ROOM LATHES
PRODUCTION LATHES**

WEISSER HEILBRONN

1539 West Elizabeth Ave.

Telephone: Linden 3-9110

Linden, New Jersey

In Canada: Transocean Machine Co., Inc., 1170 Drummond St., Montreal, P.Q.

For more data circle 471 on Reader Service Card

June, 1955

modern machine shop 265

new shop equipment . . .

designed to enable the precision cutting of tapers without disturbing straight work alignment or disconnecting the cross carriage has been announced by The L. A. Fitzer Tool

Works, 329 E. Park Blvd., Villa Park, Ill. According to the manufacturer, the unit needs only to be inserted in the tailstock in place of the center used for straight work. Equipped with a micro-screw adjustment and positive locking device, the attachment is said to enable accurate tapers to be cut up to 3 inches of the full length between centers.

A unique feature of the taper attachment is the incorporation of a carbide ball-tip center which, it is claimed, provides perfect spherical contact at any angle and affords unusually long life at high speeds. The attachment can also be furnished with a pointed center.

For more data circle 103 on Reader Service Card

★ ★ ★

CAMS

MADE TO YOUR SPECIFICATIONS

— Except Screw Machine Cams —

Design Assistance Offered

KIDDE PRECISION TOOL CORP.

15 LOCUST AVENUE, ROSELAND, N. J.

For more data circle 472 on Reader Service Card

DIVIDING HEAD HAS CHUCK JAW CAPACITY OF 2½ INCHES

Custom Scientific Instruments, Inc., Arlington, N. J., has announced a precision-built dividing head which has a 4-inch swing and a jaw chuck capacity of 2½ inches. The head utilizes a reversible indexing plate having 18 rows of holes ranging from 15 to 49 holes per circle. The unit is ball bearing constructed on a meehanite cast iron base with all castings being heat treated. The adjustment from horizontal to vertical is graduated in degrees. The head swivels 110 degrees, 10 degrees below horizontal to 10 degrees beyond the

REID

TOOL ROOM ACCESSORIES

C.I. HAND KNOBS




LONG SHANK
With Wrench Hex.

SCALLOPED



PRONG

Three styles. Many sizes. Made of fine grain cast iron. Smooth finish. No sharp edges. Low prices. **FREE 56 PAGE CATALOG** on request describing dozens of items needed in tool room. Top quality. Lowest prices.

REID TOOL SUPPLY CO.

Muskegon Heights, Michigan

For more data circle 473 on Reader Service Card

MAKE HARDNESS TESTS

With The

KING PORTABLE BRINELL

Puts a load of 3000 kg. on a 10 mm ball. Can be used in any position — even upside down. Removable test head for testing very large parts. Guaranteed to make accurate Brinell tests. Throat: 4", gap 10", wt. 26 lb.

ANDREW KING
Box 606-H Ardmore, Pa.



For more data circle 474 on Reader Service Card

Precise
hole location,
easy contour
inspection
with *new*
machine tool
microscope



- Wide field of view ($\frac{1}{4}$ "); 30x magnification
- Gages accurately to .0001—at a glance
- Mounts on offset bracket, or directly in the spindle
- Fits nearly any machine tool
- Image always appears erect and true
- Ideal for checking slots, contours, surface conditions, or transferring hole locations from template to workpiece.

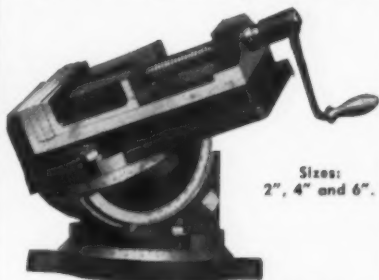
Write today for complete details.

THE PERKIN-ELMER CORPORATION



Norwalk, Connecticut

TOOLMAKERS!



Sizes:
2", 4" and 6".

NOW SET-UP FASTER--

Save time on intricate, angular set-ups with the fully universal MASTER MULTI-SWIVEL VISE. Three swivels instantly set any compound angle. Used worldwide. Interchangeable platens optional.

Write for Circular

DONOVAN MFG. CO.
80 BATTERYMARCH ST., BOSTON 10, MASS.

For more data circle 475 on Reader Service Card For more data circle 476 on Reader Service Card

So many standard styles one must be just right for you!



For more than 66 years we have been producing metal-working tools and adding to our standard line. Our aim was, and is, to have the tools you need immediately available when you need them—at regular low, standard prices.

Today we keep such an extensive range of styles and sizes of PUNCHES and DIES on hand that we can fit most makes of hand, foot, and power operated punch presses from stock.

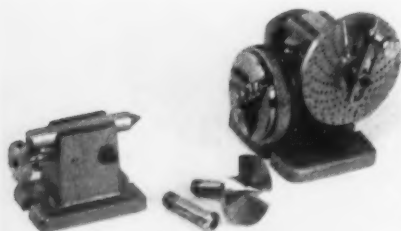
SEND FOR OUR COMPLETE CATALOG SHEETS. SEE HOW YOU CAN SAVE TIME AND MONEY WITH LEWTHWAITE TOOLS.

T. H. LEWTHWAITE MACHINE CO., INC.

317 East 47th Street
New York 17, N. Y.

For more data circle 477 on Reader Service Card

new shop equipment . . .



CSI Precision - Built Dividing Head

vertical axis. Side A of the index plate has the following hole circles: 15, 16, 17, 18, 19, 20, 21, 23 and 27. Side B has the following hole circles: 29, 31, 33, 37, 39, 41, 43, 47 and 49. Divisions obtainable with this plate are said to be all numbers up to 50, all even numbers up to 100 except 96, all numbers

divisible by 5 up to 100, and many above that.

The dividing head may be used with the CSI Microscope Stage or on any equipment used for profiling, drilling, light milling, layout work and engraving on dials, cams, templates, round dies, cylindrical parts or anything requiring angular setups and circular or semi-circular divisions within its capacity.

For more data circle 104 on Reader Service Card

★ ★ ★

**MACHINE SHARPENS CIRCULAR
SAWS FROM 1/2 TO 14
INCHES IN DIAMETER**

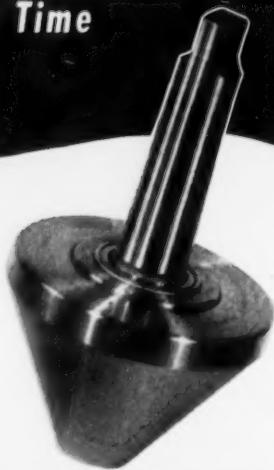
Hamco Machines, Inc., Rochester, N. Y., has announced an automatic saw sharpening machine which is designed to handle all circular metal-cutting saws from 1/2 to 14 inches in diameter,

**PERFECT ALIGNMENT Every Time
with ROOFE Heavy-Duty
BULL NOSE CENTERS**

Two double rows of quality bearings in the large and small ends of the nose of this live center are your assurance of perfect alignment on any type of work.

Two shank sizes provide diameters from 1/2" to 7 1/2" for a wide range of work with a single center.

Write now for complete catalog of all types of ROOFE Live Centers.



HOUSTON GRINDING & MFG., CO., Inc.

2110 QUITMAN STREET • HOUSTON 10, TEXAS

Reliable Distributors Wanted

For more data circle 478 on Reader Service Card

NUMBERALL

MODEL 70

MULTI-WHEEL NUMBERING MACHINE

The most efficient method of stamping numbers into metal. Repeats the same numbers until changed. Model 70 NUMBERALL Machines are used in all industries to mark various parts. Stamps numbers, etc., quickly... neatly. Perfectly aligned. Much better marks are produced by these machines than by single stamps or steel type, and at a far lower cost. Shank for Hand or Press and with any number of wheels from 3 to 20. Can be furnished in 1/32" to 3/4" high figures, sharp face gothic or shaded roman style.



Hand shank illustrated. Press shank for foot or power presses also available.

Write for Bulletin MS-70.

NUMBERALL STAMP & TOOL CO.
HUGUENOT PARK STATEN ISLAND 12, N. Y.

For more data circle 479 on Reader Service Card

WHOOOEE!

YOU DON'T HAVE TO LOOK FAR TO DISCOVER W. H. O. * IS TOPS IN THE PRECISION SCREW MACHINE PRODUCTS FIELD.

CAP SCREWS
COUPLING BOLTS
SET SCREWS
MILLED STUDS
... our specialty.

* **Wm. H. Ottumiller Co.** YORK, PA.
For more data circle 480 on Reader Service Card
June, 1955

Raise it! Lower it!



Increase production...

RAYMOND PORTABLE ELEVATING TABLE

Keep materials at right height for working with a RAYMOND Portable Elevating Table. Elevates and lowers hydraulically—use it for die handling, sheet feeding, work positioning, supporting overhanging work.

30" square top rotates or locks when desired. Foot pedal operation frees hands. Floor lock holds it in place. Standard model elevates 28" to 44"; Telescopic model, 28" to 50". Both have 2,000 lb. capacity. Send for Portable Elevating Table bulletin.

The RAYMOND CORPORATION

8839 Madison St., Greene, N. Y.

For more data circle 481 on Reader Service Card

modern machine shop 269

new shop equipment . . .

from finest teeth up to two teeth per inch, inclusive. The machine utilizes master indexing which is said to make it possible to cut in all new teeth with perfect concentricity or even change the number of teeth in a saw to more or less per inch as desired. It is also possible to sharpen up to six or seven saws at one time. Friction clamps are provid-

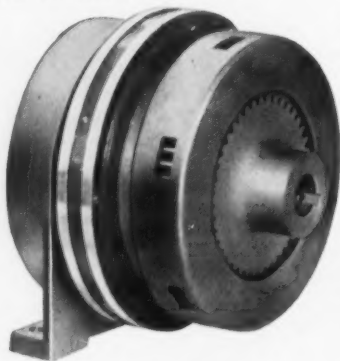
ed to hold the saw blade during sharpening operations, and eight different size arbors are furnished to accommodate the standard range of circular saws from $\frac{1}{4}$ to 1 inch in eighths.

The grinding wheel center is raised or lowered in respect to the saw being sharpened by means of a graduated dial. According to the manufacturer, this not only assures accurate on-center contact for straight-face tooth sharpening, but also above and below-

center positions for bevel tooth sharpening. Cam action synchronizes the indexing and grinding feed motion into a rapid automatic operation. The machine also features the indexing adjustment for precision alignment of tooth with grinding wheel; simplified feed finger tension adjustment; positive lock for grinding

Be Sure with a Matched-to-the Machine

STEARNS MAGNETIC CLUTCH



On many machines a standard magnetic clutch or clutch brake does the job. Others require a *special custom-made* unit for most profitable results. Stearns provides *both* with these big advantages:



- Torque range from .4 to 30,000 lb. ft.
- Low inertia — fast, smooth engage and disengage. Split shaft, through shaft, two speed drives, forward and reversing drives — other special applications.
- Quiet and cool running. No metal-to-metal contact, no sparking.
- Automatic or manual control.
- Simple adjustment — no toggles, yokes, shifters.

Write for new literature on Stearns magnetic clutch and clutch brakes.

1054

MAGNETIC EQUIPMENT

FOR ALL INDUSTRY

STEARNS



MAGNETS

664 SOUTH 28TH STREET

• MILWAUKEE 46, WISCONSIN

For more data circle 482 on Reader Service Card



**Hamco Automatic
Saw Blade Sharpener**

Peaslee
TAPER PINS

**STANDARD
AND
SPECIAL**

Stainless Steel
PRECISION GROUND

ALSO
SMALL PARTS
DOWELS - STRAIGHT
FORMS
MADE TO BLUEPRINTS

DEALERS INQUIRIES INVITED

PEASLEE METAL PRODUCTS CO.
470 Tolland St.
EAST HARTFORD, CONN.

For more data circle 483 on Reader Service Card

Hammond
OF KALAMAZOO

Model
"400"

**HORIZONTAL
or VERTICAL**



**4"
ABRASIVE
BELT GRINDER**

Eliminate costly hand filing, grinding, deburring and many other operations . . . There are "101" applications for the 400 in your plant. Write for bulletin.

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For more data circle 484 on Reader Service Card

A New Concept in Optical Comparator Design...



**new
WILDER
small parts
Comparator**

model C

- Vertical Design
- Erect Image
- Eye Level Screen
- Horizontal Stage

An Entirely New Model Optical Comparator Designed for 100% Production Inspection

**ACCURATE - FAST
INEXPENSIVE**

Promotes Inspection Economy

If you manufacture mass produced parts that are now being inspected or should be inspected on an Optical Comparator, the new Small Parts Comparator will enable you to inspect them quickly, accurately and economically at a surprisingly low per-piece inspection cost.

Write for Folder—Code GINZE

Geo. SCHERR OPTICAL TOOLS, Inc. 200-MM LAFAYETTE ST. • N.Y. 12, N.Y.

For more data circle 485 on Reader Service Card

new shop equipment . . .

wheel positions; timing belt drive; and a clutch which disengages grinding and indexing operations.

For more data circle 105 on Reader Service Card

★ ★ ★

FLOATING HOLDER FOR TURRET LATHES AND AUTOMATICS

Identified as the "JS," a floating holder designed for use on reaming and tapping operations performed on turret lathes and automatics has been announced by Scully-Jones and Co., 1909 S. Rockwell St., Chicago 8, Ill. The holder utilizes the double engagement spline drive principle. A balanced, constant velocity, flexible drive coupling, in which the floating and driving elements are completely independent, is



Scully-Jones Type "JS" Floating Holders

said to provide unrestricted movement in floating the reaming or tapping tool into proper alignment.

According to the manufacturer, adverse effects of "cramping" and binding are eliminated. In reaming, the holder is claimed to allow the tool to follow the drilled or bored hole exactly, eliminating bell-mouthed, out-of-round and poorly finished holes. When used for driving taps, the floating holder guards against production of oversized and tapered threads and helps to increase tool life.

Taps and reamers are mounted in the straight collet either directly or in special bushings and are locked in place by a socket head cap screw. A



**You're not gambling
IF you have an ACE in the hole!**

ACE DRILL BUSHINGS are always a sure bet!

- Quality • Accuracy
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Over 22,000 sizes, types and specifications in A.S.A. and ACE standards, micro and super sizes plus bushings for embedment in plastic or castable material.



Write for Catalog "E"

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Dowel — Straight
Countersunk — Taper
± .0001" Accuracy
.030" to .125" Diam.
Up to 2" Length

Precision Centerless Grinding Since 1931
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Over 85% of the torque wrenches used in industry are

STURTEVANT TORQUE WRENCHES

Read by Sight, Sound or Feel

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- Faster—Easier to use
- Automatic Release
- All Capacities

in inch grams
... inch ounces
... inch pounds
... foot pounds

Every manufacturer,
design and production
man should have this valu-
able data. Sent upon request.



PA **STURTEVANT CO.**
ADDISON QUALITY ISLANDS

For more data circle 488 on Reader Service Card
June, 1955

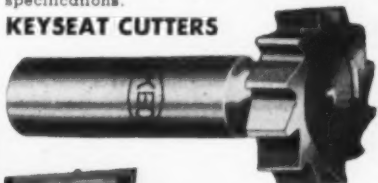
KEO

CENTER DRILLS



Made of finest high speed steel. Available in all standard sizes. Always in stock for immediate delivery. Specials made to your specifications.

KEYSEAT CUTTERS



High speed. Right hand $\frac{1}{8}$ " shank. Diameter from $\frac{1}{4}$ " to $1\frac{1}{2}$ ". Standard sizes in stock for immediate delivery. Complete set—41 sizes—available in sturdy, hardwood box. Saves time and money, because you always have the size you need.



CENTER REAMERS

High speed steel. Reamers from $\frac{1}{4}$ " to 1" regularly furnished with 60°, 82°, 90° included angle. Specials made for your specifications.

LATHE MANDRELS



Precision made of tool steel, hardened and accurately ground. Tapered .0005" to the inch. Mandrels from $\frac{8}{16}$ " to 1" are .0005" undersize at small end, from $1\frac{1}{16}$ " to 3", .001" undersize. Immediate delivery.

Write for Literature

Illustrated literature and prices on all KEO Products mailed on request.

KEO CUTTERS

19326 Woodward • Detroit 3 Mich.

For more data circle 489 on Reader Service Card
modern machine shop 273

new shop equipment . . .

through hole in the shank of the holder permits "stubbing" tools having long shanks when using a bushing in the collet. Body diameter and minimum projection of the largest size holder, designed to accommodate tools having 1½-inch diameter shanks, are 3½ and 3 inches respectively. The "JS" holder

is available in five standard models with collet hole diameters of ⅜, ½, ¾, 1 and 1½ inches.

For more data circle 106 on Reader Service Card

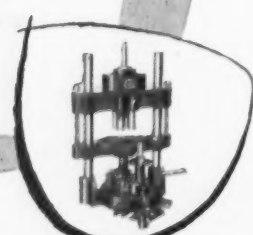
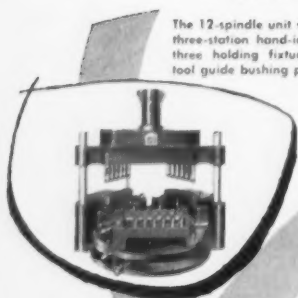
★ ★ ★

"COLOR-GLANCE" BRINELL HARDNESS TESTER

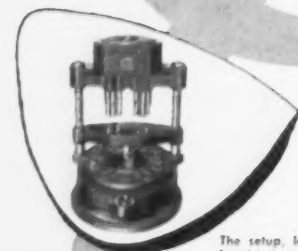
Steel City Testing Machines, Inc., 8817 Lyndon Ave., Detroit 38, Mich., has announced a "color - glance" Brinell hardness tester utilizing three colored lights which signal the relative Brinell hardness of the test piece and which make all the decisions of acceptability or rejection. When tied in with some automatic means of handling the parts on a production line basis, the unit can

IT'S SAFER TO BUY DRILL HEADS, FIXTURES and BUSHING PLATES AS A COMPLETE PACKAGE

The 12-spindle unit shown below has a three-station hand-indexing table with three holding fixtures, complete with tool guide bushing plates.



Shown above is a drill head complete with boring bars with Carbide-tipped cutters and Stellite wear strips. The indexing table has necessary holding fixtures with bushing guide plate.



The setup, left, has a two-position, hand-indexed fixture.

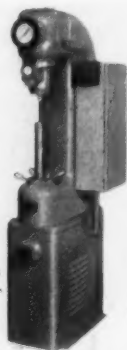
Write for details on any type of universal joint adjustable head. Ask also about our totally enclosed gear-driven adjustable, fixed center, or individual lead screw tapping heads.



UNITED STATES DRILL HEAD COMPANY

616-618 BURNS STREET • CINCINNATI 4, OHIO

For more data circle 490 on Reader Service Card



Steel City "Color-Glance" Brinell Hardness Tester

THE VISE WITH A THOUSAND GRIPS



'FLEXIBLE JAWS' grip all shapes. Grips secure and positive for precise milling, drilling and cutting operations. Eliminate the time and expense of blocking and shimming irregular pieces for toolroom machining. Applicable on any machine tool. Try it in your shop. Save time and dollars on small production runs.

WRITE FOR INFORMATION TODAY!

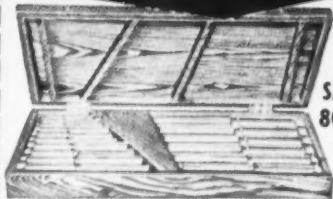


AMERICAN POSITIVE GRIP VISE CORP.

6-C Olivine St., Willimansett, Mass.

For more data circle 491 on Reader Service Card

MANHATTAN'S MIRACLES! GOVERNMENT SURPLUS



SAVE
80%

SET OF CARBON STEEL **ALL NEW** **HAND REAMERS**

STRAIGHT FLUTE In Wooden Case
SIZES 1/4" to 1-1/4" IN 32NDS

Tremendous savings on all new cutting tools. Send us your inquiries and write for circular listing sensational bargains!

Regular price \$180.

OUR low price

only \$35.00

Limited quantity!

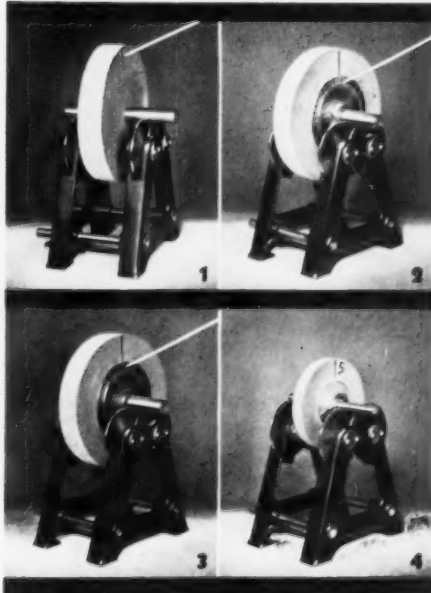
MANHATTAN SUPPLY COMPANY

The Cutting Tool Discount House

151-A GRAND ST., NEW YORK 13, N. Y.

Telephone: CAnal 6-4992

For more data circle 492 on Reader Service Card



QUICK, EASY WAY TO BRING GRINDING, BUFFING, AND POLISHING WHEELS INTO BALANCE . . .

(1) Balance on Anderson super-sensitive Balancing Way and mark light side. (2) Line up mark with both zeros on Anderson Speedi-Balancer. (3) Turn both discs till wheel balances. (4) Record setting. Wheel is now prebalanced for instant use when needed: just use Speedi-Balancer, set to number marked, as outside collar. Save time. Eliminate weights. Reduce vibration. Increase motor bearing life. Improve motor performance. For information on sizes, types, and prices of Anderson Balancing Ways and Speedi-Balancers, write for Bulletin 6-22.

ANDERSON BROS. MFG. CO.

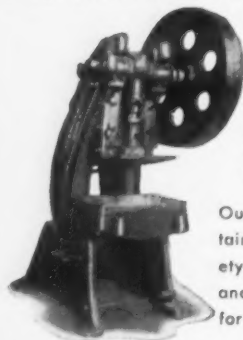
ROCKFORD, ILLINOIS

For more data circle 493 on Reader Service Card

new shop equipment . . .

be made to physically sort the work after testing, thereby making possible automatic Brinell hardness testing. The three signal lights are set up so that yellow indicates "too hard," green indicates "within range," and red shows

RECLINABLE POWER PRESSES



Ideal for general stamping work . . . 4 to 100 tons capacity. Can recline to 40° with perfect safety.

Our catalog contains a wide variety of press types and sizes. Write for it today.

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ZEH & HAHNEMANN CO.
190 VANDERPOOL ST. NEWARK 5, N. J.

For more data circle 494 on Reader Service Card

"too soft." Limits are easily adjustable to suit the requirements of each job. During the test cycle, one of these lights flashes on, indicating the hardness category of the part under test.

Basically, the machine is the same as the firm's Models KDR-6 and KDR-10 direct-reading type Brinell testers. A dial indicator with adjustable electric contacts has been substituted for the standard indicator previously used, and this is connected to a specially-designed control panel. Electronics are not employed, and the machine itself is hydraulically operated. The standard "color-glance" unit is available in two sizes; namely, the Model KDR-6E which has a 6-inch throat depth, and the Model KDR-10E which has a 10-inch throat depth. Both machines have 14-inch maximum vertical opening.

For more data circle 107 on Reader Service Card

FLOOR PATCHING AND RESURFACING MATERIAL IS CORROSION RESISTANT

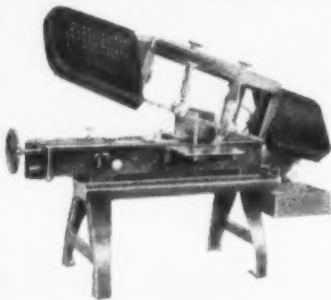
Identified as "Vyniflex," a floor patching and resurfacing material designed for floors subject to acids, alkalis, salts, oils, fats, grease, water, slip-hazards, trucking or abrasion has been announced by Flexrock Co., 3615 Filbert St., Philadelphia 1, Pa. According to the manufacturer, the material has

For BIG Savings at little cost

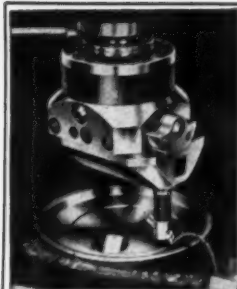
Variable Speed Drive—Now Standard Equipment

MODEL L — the economy, cial precision guides for hinge-type saw in our line. longer blade life. Floor space only 20" x 66". Send 9" x 16" capacity. One-piece welded frame lowers hydraulically. Easy blade adjustment for proper cutting. Quick blade change from top of machine. Spe-

W. F. WELLS & SONS
THREE RIVERS, MICHIGAN



For more data circle 495 on Reader Service Card



REASONS WHY MODERN ENGINEERS SELECT The Wohlhaupter **MASTERHEAD**

For Precision Work & Most Economical & Automatic Operation

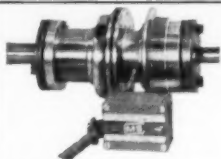
- The MASTERHEAD does Boring, Facing, Recessing, Undercutting, Outside Turning, etc.
- It does this in One Operation and on One Machine.
- Automatic Feeds. • Automatic End Release.
- Increases the capacity of your present equipment.
- Increases Production, makes Better Finished Work.
- Nine Models available for work up to 36 1/4" diameter. Also taper cutting heads.

Sole Agent

Send for illustrated literature.

KARL A. NEISE, 404 Fourth Ave., Dept. MMS, New York 16, N. Y.

For more data circle 496 on Reader Service Card



Transmission Type

RLH

CONSTANT TORQUE COUPLINGS with AUTOMATIC COMPENSATION

for Friction Variation

WRITE FOR BULLETINS



Spindle Type

Torque settings unaffected by normal variations in co-efficient of friction. Breakaway torque and running torque become truly constant.

SPECIAL SHANKS FURNISHED TO ACCOMMODATE INDIVIDUAL APPLICATIONS

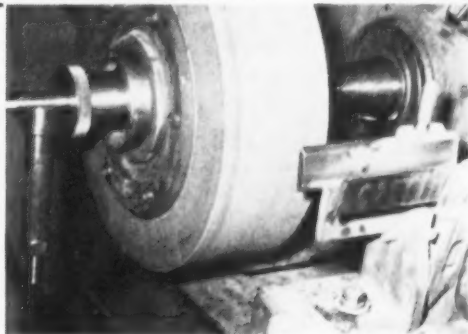
BUFFALO MACHINERY CO., Inc. 837 GRANT STREET BUFFALO 13, N. Y.

For more data circle 497 on Reader Service Card

Precision Balancing of Grinding Wheels Made Easy with the new

DRIVER PORTABLE BALANCING UNIT

for complete information write:



- ★ Saves up to 80% of time and labor on every balancing operation. No lifting.
- ★ Gives faster production and far greater precision on close tolerance grinding.
- ★ Ball bearing arbor attaches to spindle.
- ★ Wheel is moved onto arbor firmly locked in place and weights adjusted for balance.
- ★ Support at end of arbor for centerless and other heavy wheels.
- ★ Low in cost. Easy to operate. A unit is made for nearly every type of grinder. Wheel shown 6-20-12.

CRESTLINE PRODUCTS, INC.

208 Paramount Bldg., Fort Wayne 2, Ind.

For more data circle 498 on Reader Service Card

new shop equipment . . .

perfect adhesion to any clean surface, even if it is damp, assuring excellent feather-edge patching, grouting, re-pointing of tile or brick or resurfacing. The material, it is claimed, will take any traffic the sub-floor can, and it is shock-proof, non-inflammable, warm and quiet to the feet. Overlays can be made at only $\frac{1}{8}$ inch, and it is ready

for use in from 18 to 24 hours after it is applied. The material is available in four colors, plus natural.

For more data circle 108 on Reader Service Card

★ ★ ★

GEARSHIFT DRIVE HAS CAPACITY OF 5 HORSEPOWER

Designated as the Type R3DC, a gearshift drive which is built with a capacity of 5 h.p. at 1,800 r.p.m. input

and provides four constant horsepower output speeds when used with a single speed motor has been announced by The Lima Electric Co., 126 Findlay Rd., Lima, Ohio. When used with a two-speed motor, the unit develops eight output speeds. The type R3DC drive has the following primary gear ratios: 4.15 to 1, 3.15 to 1, 1.85 to 1 and 1 to 1. In addition, 11 optional secondary gear ratios are available, ranging to a maximum of 2.25 to 1. Depending on the speed of the motor used with the transmission, the speed range runs from a low of 93 to a high of 1,730 r.p.m. (full load).

According to the manufacturer, the



Simple as 1-2
Low Cost Too!

**GILLEN
GROOVE PINS**



COST REDUCERS

Use this Gillen Groove Pin for faster assemblies, better appearance. Three grooves compress for tight fit. Will not loosen from vibration. Simple, Strong, Speedy, Re-usable. Stocked many Lengths and Diameters. Ask for Sample, Specify Size.

Write for Size and Price List
Gillen Groove Pins

John Gillen Company

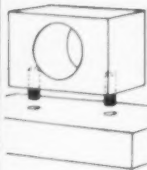
Makers of Groove Pins
Taper Pins - Machine Keys & Parts

2542 S. 50TH AVENUE
CICERO 50, ILLINOIS

For Many Uses



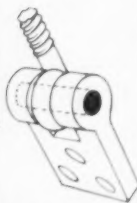
No Threading



No Tapping

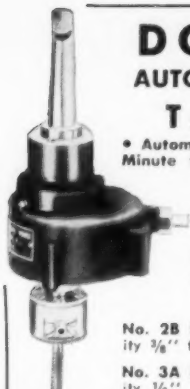


They Hold Fast



They Look Better

For more data circle 499 on Reader Service Card



DORMAN AUTOMATIC REVERSE TAPPERS

- Automatic Torque Control, One Minute to Adjust, Prevents Tap Breakage, Operator Need Not Be Skilled.

- WIDE RANGE TAP CAPACITY.

No. 1A FRICTION DRIVE TAPPER — capacity No. 2-56 to 3/8" in Steel — 1/2" in Aluminum.

No. 2B POSITIVE TAPPER — capacity 3/8" to 7/8" in Steel.

No. 3A POSITIVE TAPPER — capacity 1/2" to 1 1/4" in Steel — 1/2" to 3/4" Pipe Taps.

No. 4A TAPPER — capacity 3/4" to 2" in Steel including Pipe Taps.

- PRODUCTION THREADERS with Round Split . . . Button . . . Acorn Dies.

Priced from
\$50.00
Write for
Bulletin
IMMEDIATE
DELIVERY

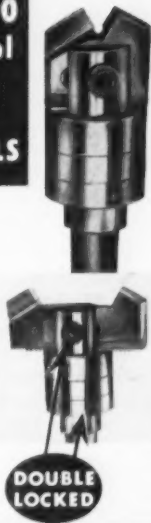
THRIFTMASTER PRODUCTS CORPORATION

Division of Thomson Industries, Inc.

1034 N. PLUM STREET, LANCASTER, PA.

STANDARD UNIVERSAL ADJUSTABLE AND SPECIAL FIXED CENTER DRILLHEADS

**SAVE \$10,000.00
in perishable tool
inventory with
HAYDEN
ADJUSTABLE DRILLS**



Only two ordinary drills, 1" and 2", needed in stock for hogging out metal. A Hayden Adjustable Drill will then cut the hole to its specified size. Adjustable drills come in two sizes, 1" to 2", 2" to 4". Blades are high speed steel. Carbide tipped blades at extra cost. Write for Literature and Price List.

HAYDEN TWIST DRILL CO.

8622 Lynden Ave., Detroit 38, Mich.

For more data circle 500 on Reader Service Card For more data circle 501 on Reader Service Card

People work better when they SEE BETTER



AT CUTLER-HAMMER

a tool room worker uses the MAGNI-FOCUSER
to read a Vernier Height Gauge

MAGNI-FOCUSER

SPEEDS PRODUCTION
With Third Dimensional (3-D) Vision
Leaves both hands free to work

Magni-Focuser—the binocular magnifier—reduces eye-strain and prevents squinting—thereby speeding production, increasing accuracy and minimizing the chance of errors and accidents.

Gauge reading, layout work, inspection, tool and die work are just a few of the jobs that need the Magni-Focuser. Speeds precision assemblies, blue print work. Restores the usefulness of the skilled hands of many older workers whose vision needs a seeing aid.

Magni-Focuser can help your plant produce better. Immediate delivery. 10-day trial without obligation. Return to us if not satisfied. \$10.50.

Send for descriptive folder

EDROY PRODUCTS CO. 480 Lexington Ave.,
Dept. P, New York 17, N. Y.

For more data circle 502 on Reader Service Card

(Advertisement)

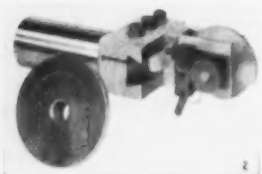
Screw Machine Attachment Eliminates Separate Marking Operations

Automatic die marking of part numbers, patent numbers, trade marks, etc., during the operating cycle of automatic and hand operated screw machines, bench and turret lathes, etc., on almost any surface of a part is possible with the complete line of automatic roll markers available from New Method Steel Stamps, Inc., 147 Joseph Campau, Detroit 7, Michigan.

Suitable for both light and heavy work, the markers are practically fool-proof and eliminate the need for separate setups for marking, thus reducing cost, scrap, etc. Quick interchangeable roll dies give remarkable versatility and reduce time for setup changeover.



1. Model 500-C for automatically marking on outside cylindrical surface of screw machine parts, manufactured by N. M. S. S., Inc., Detroit.

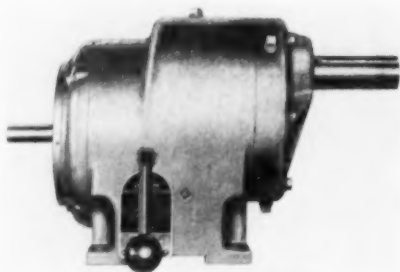


2. Model 600-E for marking on the end face of parts. Normally installed in tailstock of a screw machine or similar position on other machines.

Illustrated are two of the three basic models of the cost cutting markers. Model 700 (not shown) is for marking and cutting off at the same time. The marker occupies the cutoff slide, leaving other stations open for machining operations. New Method also manufactures a complete line of hand stamps, inspectors' stamps, embossing dies, marking hammers, type and type holders, etc. Precision marking and engraving services available.

For more data circle 503 on Reader Service Card

new shop equipment . . .



Lima Type R3DC Gearshift Drive Unit

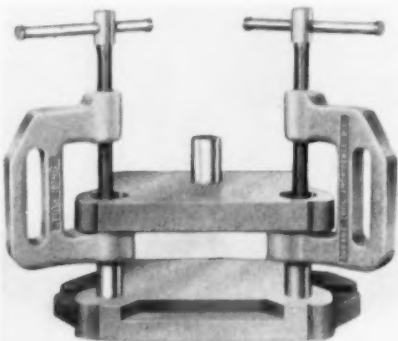
sliding gear transmission is ideally suited for application to all types of machinery and processing equipment where a lower than normal range of positive selective speeds is required.

For more data circle 109 on Reader Service Card

★ ★ ★

PULLERS SEPARATE MEDIUM AND LARGE SIZE DIE SETS

Identified as "Shur-Pull," a die set pullers which are designed to easily separate medium and large size die sets



Durant "Shur-Pull" Die Set Pullers



At new low price \$124.50
with diamond.

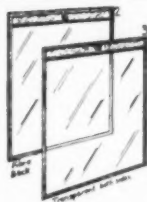
SOMERSET TOOL CO. 320 Virginia St.
Hillside, N. J.

For more data circle 504 on Reader Service Card

NEW 1955 MODEL "SS"

RADIUS DRESSER

outperforms them all
Cut production time
without sacrificing accu-
racy! Easy to set, easy
to see, eliminates nec-
essity of guard removal.
Somerset Radius Dress-
er turns "tricky" jobs
into routine operations.
Write for free folder
and price list.



WADE ENVELOPES

protect
Shop Orders, Drawings,
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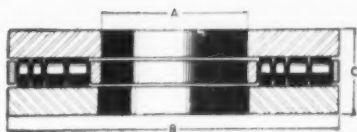
Two styles. No. 2 with fibre
back, No. 3 transparent both
sides. Non-inflammable ace-
tate windows. Special style
or size to order.

Write for details.

WADE INSTRUMENT COMPANY

Dept. M, R.F.D. No. 1, Chardon, Ohio

For more data circle 505 on Reader Service Card



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Made with flat seats and in various
self-aligning types, especially adapted
for heavy loads at slow or moderate
speeds.

STANDARD SIZES ARE SHOWN IN OUR
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SERVING INDUSTRY FOR OVER 43 YEARS.

THE GWILLIAM CO.

358 FURMAN ST. • BROOKLYN 1, N. Y.

For more data circle 506 on Reader Service Card



Lang Tool & Die Co., Glendale, Calif.,
uses Cerromatrix to anchor small punches
in high production lamination dies,
which they guaran-
tee for 2,000,000
blanks. The photo-
graph shows a die
for rotor and stator
blanks which runs
135 strokes per
minute. Send for
literature.

CERRO DE PASCO CORPORATION



Dept. 10, 40 Wall St.

New York 5, N. Y.

For more data circle 507 on Reader Service Card

new shop equipment . . .

with a minimum of effort have been announced by Durant Tool Supply Co., 136 S. Water St., Providence 3, R. I. The pullers feature built-in handles, and a sliding adjustment bar is said to provide for easy operation. According to the manufacturer, the pullers

are designed to easily remove the punch holder from the die shoe by a straight upward pull and will not damage the die set. There are no wearing parts incorporated in the pullers. The die set pullers, it is claimed, will fit most sizes of die sets.

For more data circle 110 on Reader Service Card

★ ★ ★

RADIAL ARM ROUTER FEATURES POWER ASSIST

To eliminate the arduous task of manually routing wood and non-ferrous metals exceeding $\frac{5}{8}$ inch in thickness, Onsrud Machine Works, Inc., 3924 W. Palmer St., Chicago 47, Ill., has announced a radial arm router which incorporates a power feed mechanism. The power assist operates on the principle of applying motivating power in the direction required by the operator. The power assist is operated at the operator's will; he merely moves the lever in the direction he wishes the router to move, and the arm segments react accordingly. For light work, corners, and so on, the power assist is not used.

The principle of the entire system is the use of hydraulic motors at each pivot point, controlled by a hydraulic valve which controls the rotation of the pivot shafts in the direction selected by the operator. The control, it is claim-

**Accurate Hole Transfer Made Easy With
NIELSEN TRANSFER SCREWS**



Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. 8 sizes, from $\frac{3}{16}$ " to $\frac{1}{4}$ " U.S.S. Inexpensive — Last for years.

Write for Circular
NIELSEN TOOL & DIE COMPANY
P. O. Box 1067
Berkley, Mich.

For more data circle 508 on Reader Service Card

**5" Hinged
Sine
Plate**
ONLY
\$109.50



• Precision • Convenience • Economy

Exclusive locking device provides a rigid unit for operations such as grinding. May be used with a permanent magnetic chuck. Accurate to .0002" in center distance and parallelism for length of tool.

BALD EAGLE SINE TOOLS

| No. | Center Dist. | Width Top | Length | Price w/Oak Case |
|------|--------------|-----------|--------------------|------------------|
| 1605 | 5" ± .0002" | 3" | 6 $\frac{3}{8}$ " | \$ 43.00 |
| 1610 | 10" ± .0002" | 5" | 11 $\frac{1}{8}$ " | \$ 95.00 |
| 1705 | 5" ± .0002" | 1" | 6 $\frac{3}{8}$ " | \$ 25.25 |
| 1805 | 5" ± .0002" | 3" | 8 $\frac{1}{8}$ " | \$109.50 |

Precision ground
Hardened rolls
Tapped holes
End plates
Immediate shipment

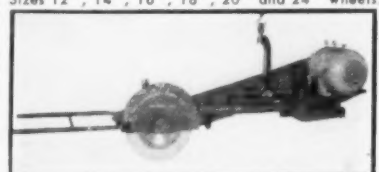
F.O.B. St. Paul.
Order from Your Dealer or Direct

Bald Eagle Tool Co.
357 Minnesota St. St. Paul 1, Minn.



For more data circle 509 on Reader Service Card

MUMMERT-DIXON SWING FRAME GRINDERS
Sizes 12", 14", 16", 18", 20" and 24" wheels.



Ask for Descriptive Circular
MUMMERT-DIXON CO.
120 Philadelphia St. • Hanover, Pa.

For more data circle 510 on Reader Service Card



MARK OF QUALITY
STANDARD
MACHINE RACKS



The Standard Steel Specialty Company, a pioneer in the machine rack field, has brought an accuracy and finish to this product that cannot be matched by any other company.

This rack is made from special machinery steel finished to our specification . . . cut by expert mechanics on machines designed especially for this work.

Send for our new catalog which gives information on Woodruff keys, taper pins, machine keys, and features a chart for checking machine racks.

STANDARD STEEL SPECIALTY CO.
BEAVER FALLS • PENNSYLVANIA
Plants: Beaver Falls, Pa.; Hammond, Ind.

For more data circle 511 on Reader Service Card

10" — 12"
UNIVERSAL DIVIDING
HEADS WITH
DIRECT INDEXING



Optional SWIVEL BASE converts a conventional dividing head into a universal work head or rotary table. Change-over is accomplished in seconds without tools or Wrenches.

Also available in 6" size and in 10"-12" spiral drive, right or lefthand.

Write for Folder

CARROLL DIVIDING HEAD CO.
3525 Cardiff Ave. • Cincinnati, Ohio

For more data circle 512 on Reader Service Card

June, 1955

DESIGNERS



VIMCO Lights

**INCREASE
PRODUCTION**

**by Eliminating Fatiguing
Shadows**

HERE'S HOW! Shadows . . . met in even the most modern plant . . . cause eye strain and decrease worker efficiency. Your machine's production suffers. Errors increase. Vimcolights do away with eye strain . . . help keep your machine operating at rated capacity . . . help create customer satisfaction. Six standard models for every use . . . and "specials" available for specific designers' needs.

WRITE FOR BULLETIN 85

Vimcolights are UL listed

VIMCO MFG. CO., Inc.

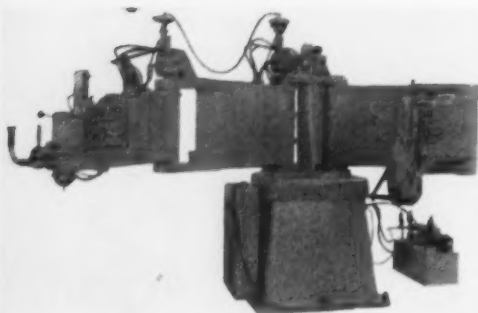
111 Brayton Street

Buffalo 12, N. Y.

For more data circle 513 on Reader Service Card

modern machine shop 283

new shop equipment . . .



Onsrud Power-Assisted Radial Arm Router

ed, always returns to normal as soon as the operator releases the lever. The operator, however, keeps the head in contact with the form bar at all times. This is said to be principally the differ-

ence between a power feed machine and a power assist machine. Other improvements are redesigned arm segments made of aluminum; motor slide stroke increased from 4 to 6 inches; improved lifting control mechanism for the cutting units; cutter motor increased from 5 to 8 h.p.; and Norgren Micro Lubrication.

For more data circle 111 on Reader Service Card

★ ★ ★

DIAL FEED PRESS FOR HIGH SPEED PRODUCTION MARKING

Designated as the Model 400, a precision dial feed press for high speed production marking has been announced by The Noble & Westbrook Mfg. Co., 25 Westbrook St., East Hartford 8, Conn. According to the manufacturer, the press is air operated and electronically controlled, and will produce serial numbered workpieces at the rate

SAVE COSTLY SET-UP TIME!

**Instant Pin-Point Positioning
with these NEW MAGNETIC BASE
DIAL INDICATOR HOLDERS**

"TINY-TITAN

NO. 130"

Magnetic Base
Indicator Holder
with Precision
Adjustment



- ✓ New, 3-Step Universal Rod in 7/32, 1/4 and 5/16" diameters, for all indicators.
- ✓ Mounts to flat or down to 3/4" round surface with 65 lb. pull.
- ✓ Adaptor permits full 360° adjustment in all directions.
- ✓ Many other new features.

PRICE: \$9.50,
Attractively Boxed.



Model 160 being used to indicate workpiece on Engine Lathe

Send for Bulletin No. 605, covering other Tiny-Titan tools.

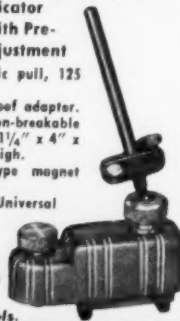
"TINY-TITAN

NO. 160"

Heavy Duty, Duplex Magnetic
Base Indicator
Holder with Pre-
cision Adjustment

- ✓ Magnetic pull, 125 lbs.
- ✓ Fool proof adapter.
- ✓ Case non-breakable tenite, 1 1/4" x 4" x 1 1/4" high.
- ✓ Jack type magnet release.
- ✓ 3-Step Universal Rod.

PRICE:
\$17.75,
Attractively
Boxed.



ENCO MANUFACTURING COMPANY, Dept. 165
4520-26 W. Fullerton Ave., CHICAGO 39, ILL.

Sold all over the U.S. and Canada
through Enco franchise dealers.

For more data circle 514 on Reader Service Card

CAM MILLING JIG BORING



A SPECIALIZED CAM MILLING SERVICE, JIG BORING
... SPOT WELDING
... CONTRACT PRODUCTION
... EXPERIMENTAL DEVELOPMENT

SEND FOR NEW CATALOG NO 52-CM

EISLER ENGINEERING CO., INC.
734 S. 13TH ST., NEWARK 3, N. J.

For more data circle 515 on Reader Service Card

CUT TOOL COSTS broken tools made like new again with **NU-TANGS**

Twisted or broken tangs replaced at low costs on any tool with a Morse Taper (sizes 1 to 4). Hundreds of leading industries save money on drills, reamers, countersinks, cutters, drivers, the NU-TANG way. Prompt delivery. Send for prices—or send tools for repair. All work guaranteed.

NO WELDING! NO SLEEVES! NO SHORTENING! NO DISTORTION! GUARANTEED STRONG AS NEW!

Send them to us like this! We return them like this!

• Patent Pending • **NU-TANGS INC.** 1339 Bates Avenue Cincinnati 25, Ohio

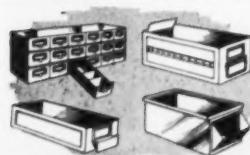
For more data circle 516 on Reader Service Card

IMMEDIATE SHIPMENT

- ★ PRICES . . . Low
- ★ QUALITY . . . Tops
- ★ SERVICE . . . The Best

This unbeatable combination makes BAY your best BUY -

BAY SHOP BOXES and SHOP EQUIPMENT



Complete Catalog
Price List on Request
• PHONE
• WIRE
• WRITE
Baldwin 9-1805

BAY PRODUCTS INC.

3003 N. 16th St., Philadelphia 32, Pa.

For more data circle 517 on Reader Service Card

June, 1955

Buy



PRESS ROOM EQUIPMENT

WIRE STRAIGHTENERS

Takes round or flat wire and tubing. Rolls adjustable by means of socket set screw. For use with automatic Slide, Roll or Hitch Feeds. Units available with 5, 7, 9 or 11 grooved rolls.



MOTOR DRIVEN STOCK STRAIGHTENERS

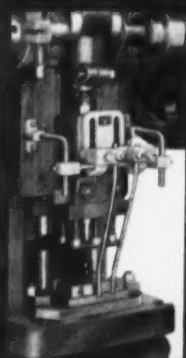
For all thin materials. Entering rolls power driven; top rolls are individually adjustable for stock thickness. Available in eight sizes.



SWEEP GUARDS

A positive safety guard on power presses. Easily installed. Downward motion of ram removes operator's hands. Rugged—withstands jarring impact of press. Needle bearings in guard housings assures long life.

Write Now for new catalog showing prices and complete line of Equipment.



DURANT Tool Supply Co.

136 SOUTH WATER STREET, PROVIDENCE 3, R. I.

For more data circle 518 on Reader Service Card

new shop equipment . . .

of 2,500 parts per hour. Featuring an air operated press head and dial feed, the basic model incorporates "Cyclo-matic" control, an electro-pneumatic circuit which provides continuous automatic cycling at any speed to suit the operator. The control is said to be unique in that the loading time and marking dwell can be varied independently

as required. The circuit also includes supplementary controls for semi-automatic operation from a foot switch and independent operation of press head and dial feed for setup purposes. The machine can also be used for crimping, staking, forming, riveting, and similar operations. Riveting or drill heads can be substituted for the press head or can be added as a second station.

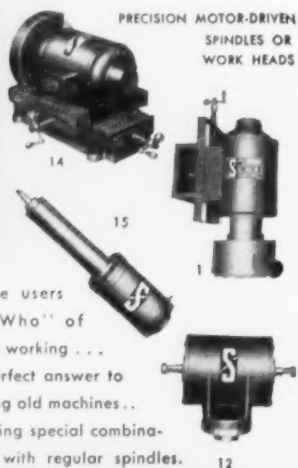
The press illustrated herewith is tooled for serial numbering a permanent

sunk impression into plastic parts. The serial numbering is accomplished with a standard automatic numbering head which indexes with each stroke of the press. The numbering head wheels are heated by means of a cartridge heater located within the numbering head spindle. The tem-

STANDARD
has a spindle
for every
purpose!



STANDARD spindle users
are a "Who's Who" of
American metal working . . .
here's the perfect answer to
modernizing old machines . . .
developing special combina-
tions with regular spindles.



PRECISION MOTOR-DRIVEN
SPINDLES OR
WORK HEADS

- ★ DYNAMICALLY BALANCED
- ★ PRECISION ENGINEERED
- ★ EXTRA HEAVY DUTY

SPECIAL PROBLEMS?

Tell us about them . . . WE'LL
DESIGN A SPINDLE FOR YOU
... we take great pride in our
reputation for custom engineer-
ing in the spindle field.

WRITE FOR LITERATURE TODAY!

the **STANDARD** electrical tool co.

PRECISION SPINDLES AND MACHINE TOOLS

2487 RIVER ROAD • CINCINNATI 4, • OHIO

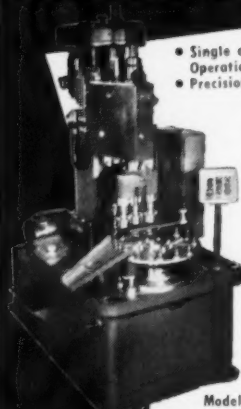
For more data circle 519 on Reader Service Card



Noblewest Model
400 Precision Dial
Feed Press

KAUFMAN TAPPING MACHINES

BUILT FOR SPECIFIC PRODUCTION JOBS



- Single or Multiple Head Operations
- Precision Depth Control

- Non-reversing Motor Drives
- Pressure Lubricated Lead Screws
- Fast, Accurate Rugged Index
- Other Head Units Available
- Other Worthwhile Features.

Catalogs Nos. 754 and 1153
Mailed on Request.

Model 75-24

MANUFACTURING CO.

551 So. 29th Street,
Manitowoc, Wis.

KAUFMAN

For more data circle 520 on Reader Service Card

MODERN IN DESIGN...VERSATILE IN PERFORMANCE!



Excelsior PRESS BRAKES

ALL STEEL

15 thru 200 ton
capacities



- DURABLE
- RUGGED
- DEPENDABLE

Excelsior products have been proved by over a half century of continuous trouble-free service on the production line.

WRITE
FOR
CATALOG

Excelsior TOOL & MACHINE CO.

31st and RIDGE AVE., EAST ST. LOUIS, ILL.

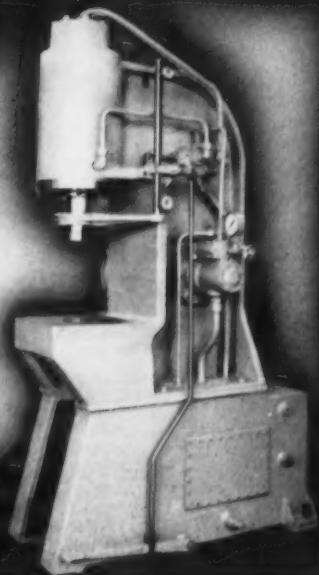
Makers of Precision Machinery For the Metal Working Industry Since 1892

For more data circle 521 on Reader Service Card

Greenerd HYDRAULIC PRESSES

- for
- ASSEMBLING
 - BROACHING
 - FORMING
 - MOLDING
 - STRAIGHTENING

Hydraulic presses made to conform to J.I.C. standards. Pictured at right is 15-ton hydraulic press.
Write for Catalog 554.



GREENERD ARBOR PRESSES

NASHUA • EST. 1883 • NEW HAMPSHIRE

For more data circle 522 on Reader Service Card

new shop equipment . . .

perature is controlled by means of a miniature adjustable thermostat mounted on the head frame. All variable, such as temperature, pressure and delay associated with marking of plastics, are readily adjustable in this machine. Both the press head cylinder and the

dial table cylinder are operated by four-way pilot operated solenoid valves. A combination air control unit, consisting of pressure regulator, gage, filter and lubricator, was installed to provide clean lubricated air to the pneumatic components. Mufflers are installed in both valves to provide quiet operation. For more data circle 112 on Reader Service Card

★ ★ ★

TOOLROOM LATHE HAS 12 SPINDLE SPEEDS

Cincinnati Lathe & Tool Co., 3260 Disney, Cincinnati 9, Ohio, has announced an all-gear head "Tray Top" Toolroom Lathe, available with either 21½ or 26-inch swing, which has 12 spindle speeds in geometric progression and a three-lever color-match direct-reading shift mechanism. The spindle, with long taper key drive nose, is rigidly mounted in three "zero" precision anti-friction bearings. Diameter of the hole through the spindle is 1-13/16 inches for the 21½-inch model, with a 2-7/16-inch diameter hole available on special request. The 2-7/16-inch diameter spindle hole is standard on the 26-inch model. All headstock bearings, gears and shafts are pressure lubricated with filtered oil.

According to the manufacturer, 54 thread and feed changes are made available through a totally-enclosed, automatically lubricated quick-change

LEAD HAMMERS—



Buy Cook "SHUR-GRIP"

They're a MUST in every shop where many blows have to be struck without marring surfaces. Available with "SHUR-GRIP" drop forged handles.

Write for circular and prices

LAWRENCE H. COOK, INC.

67 MASSASOIT AVENUE, EAST PROVIDENCE 14, R. I.

For more data circle 523 on Reader Service Card

SPRING LOADED LIVE CENTER



Eliminate "Cold Welding" of your center. Use the accurate, rugged, reliable *NIROL. The spring loaded Live Center that compensates for expansion and contraction in high speed operations.

Write for complete information.

*Reg. U.S. Pat. Off.



*NIROL MANUFACTURING COMPANY

901 H'WAY 22, N. PLAINFIELD, N. J.

For more data circle 524 on Reader Service Card

288 modern machine shop

Portable Sandblast Gun

—Complete—
simply connect
to air line

Rugged

Efficient

Guaranteed

\$27.50



A Real Performer
Handy in any shop

Box 885 M
Los Gatos, Calif.

LINDBERG PRODUCTS CO.,

For more data circle 525 on Reader Service Card

June, 1955



CONTINUOUS HINGES

Manufactured by

**AUTO MOULDING
& MFG. CO.**

WRITE FOR CATALOG

1114 E. 87TH ST.

CHICAGO 19

For more data circle 526 on Reader Service Card

GRANT RIVETERS

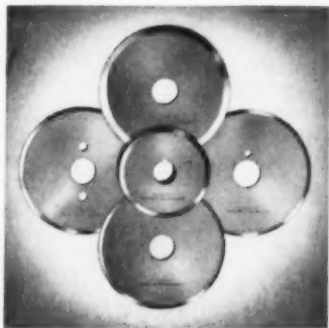


• Pioneers in the riveting field. Head rivets from smallest to $\frac{3}{4}$ " diameter, either by noiseless spinning or vibrating hammer method.—Sizes to meet all needs.—Types include Vertical and Horizontal Multiple Spindles. Write for literature—and don't forget to send samples.

THE GRANT MFG. & MACHINE CO.
96 Silliman Ave. Bridgeport 5, Conn.

For more data circle 527 on Reader Service Card

100 CUTS ONLY ▶▶



CONTINENTAL

CUT-OFF WHEELS FOR PIPES & TUBES



Precisely tempered steel for long life—more cuts between sharpenings. Bevels available for every cutting problem. Fit Continental and all other rotary Cut-Off Machines. They're profitable—try them and prove it to yourself. Request Catalog today.

**REQUEST YOUR
CONTINENTAL
CATALOG TODAY**

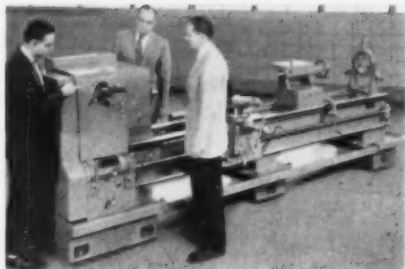
Continental **MACHINE CO.**
—SINCE 1919—

1952 N. MAUD AVE. • CHICAGO 14, ILL.

For more data circle 528 on Reader Service Card

new shop equipment . . .

gearbox. A lever to reverse the lead-screw is also incorporated. The apron is a one-piece, double-walled casting with automatic lubrication. Longitudinal and cross feeds are engaged with drop levers, operating positive jaw clutches, and a spindle start-stop lever



Cincinnati Geared Head "Tray-Top" Lathe



Combines $3\frac{3}{4}$ " longitudinal and $3\frac{3}{4}$ " transverse movements with circular movement of $7\frac{1}{2}$ " Rotary Table. • Rotary Table and Compound Table can be used separately. • Larger No. 2 Compound Table also available.

WRITE FOR BULLETIN

Rotary Tables • Multiple Spindle Index Centers • Vises • Screw Head Slotters

The John B. Stevens Company
Main Street, Somersville, Conn., U. S. A.

For more data circle 529 on Reader Service Card

is supplied at the apron and quick-change box. The bedways are ground, and lubrication of the carriage ways and cross slide is provided by an oil shot plunger on the apron.

A fully enclosed electrical panel provides a safe and accessible place for the power connections. A built-in disconnect switch guards against exposing a live panel. Power is transformed from 220 volts and over to provide only 110 volts at the operator's push buttons. The lathe can be supplied with either a 5 or $7\frac{1}{2}$ -h.p. motor mounted on the rear of the headstock. For more data circle 113 on Reader Service Card

★ ★ ★

AIR CONTROL VALVES HAVE LOCKING TOGGLES

Logansport Machine Co., Inc., 801 Center Ave., Logansport, Ind., has an-



*You Need an Extra Hand Now
to Speed Up Production!*

HEIMANN TRANSFER SCREW SETS

Here is the faster, more precise way of transferring open and blind screw holes—make savings in "wage dollars-per hour" of your expensive hands on every job. A die-and-tool maker's tool with many other applications for die makers and machinists. A set of 6 Hardened Screws nested in combination holder and wrench—no other tools needed. Get more work now—save money tool!

IN 11 SIZES—No. 6 to 1"
N.C. In all S.A.E. sizes.

HEIMANN MFG., CO. • URBANA, OHIO

For more data circle 530 on Reader Service Card

Hammond
OF KALAMAZOO

2 IN 1 NO-DUST GRINDER



SAVE OVER 50% FLOOR SPACE
THE HAMMOND WAY



DUST-LADEN AIR IS A MENACE!

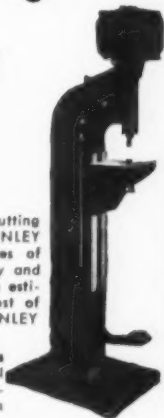
- Protect your employees' health.
- Protect nearby machine tools from dust and grit.
- Save floor space — requires only 6½ square feet. For 10", 12", and 14" wheels. Write for Catalog.

Hammond Machinery Builders
1615 Douglas Ave., Kalamazoo 54, Michigan

See us at Booths 370-371 Industrial Finishing Show

For more data circle 531 on Reader Service Card

Rivet Spinning on the LINLEY is fast, low in cost and noiseless



Save time and money by putting your riveting on the LINLEY RIVETER. Send us samples of your work and we'll gladly and without obligation give you estimates on the time and cost of handling your work the LINLEY way.

Available in sizes and types for iron and cold rolled steel rivets up to 3/8"; larger rivets of softer materials can also be handled.

Send for Bulletin R TODAY!

LINLEY BROTHERS CO.

671 State St. Ext., Bridgeport 1, Conn.

For more data circle 532 on Reader Service Card



For

MORE PERFECT TAPPING AND REAMING

To attain the high degree of perfection necessary to insure the elimination of spoilage losses caused by imperfect set-ups in tapping and reaming is not a difficult matter if you use Ziegler Tool Holders.

This is because, with the Ziegler, inaccuracies in set-ups are automatically corrected—even though they amount to as much as 1/32" on the radius or 1/16" on the diameter.

Equip your machines with Ziegler Holders and see for yourself how they will help you avoid oversize and bell-mouthed holes.

Prompt Delivery

W. M. ZIEGLER TOOL CO.

Ziegler
HOLDERS
survive

FLOATING HOLDER
for Taps and Reamers...

13566 AUBURN
DETROIT 23, MICH.

• **WRITE FOR CATALOG** •

For more data circle 533 on Reader Service Card

new shop equipment . . .

nounced three air control valves, designated as the Models 6664, 6665 and 6676, which feature locking toggles. The Model 6664 is designed for control of bleeder and pilot-operated master valves. Removing the plug in the lower port makes the two-way valve into a three-way valve. Operated by

hand, the valve will lock in the off-center (angle) position and is released manually to vertical (off) position. The locking position may be rotated 360 degrees. The valve is designed for side or base mounting and the port is $\frac{1}{4}$ inch. The dual control two-way Model 6665 is similar to the Model 6664 but has two exhaust openings which permit bleeding both ends of the master valve alternately. This provides automatic reversal when the toggle lever is returned to normal (vertical) position.

The Model 6676 is a four-way two-position valve with a locking toggle. It is constructed for side or base mounting and has a $\frac{1}{4}$ -inch port. The valve is designed for manual control of double-acting air cylinders. The valve will lock at off-center position to maintain the position of the cylinder at the end of the stroke. It is equipped with



The coolant stinks, eh?

Well, don't dump it!

We'll kill that odor with the new powder-additive: **Rance-RID**

IT'S A SERIOUS COST-PROBLEM:

Metalworking plants are pouring coolant and labor dollars down the drain. The reason: coolant turns rancid.

RANCE-RID SOLVES THE PROBLEM:

It restores the original condition of the oil emulsion. It smells, looks, and is like new. No masking odors are used . . . Use it in central-type coolant systems, or in individual machines. Treat the same coolant over and over again!

TRY RANCE-RID—AT OUR EXPENSE:

That sounds generous. Actually, it isn't. Rance-Rid sales have been built on one-ounce samples. Just one ounce treats 20 gallons of soluble oil emulsion . . . Try it—at no cost. Your inquiry brings the sample.

HERSEN CHEMICAL CO.

824-E FISHER BLDG., DETROIT 2, MICH.

For more data circle 534 on Reader Service Card



Your Inquiry
brings this
**FREE
SAMPLE**



Logansport Air
Control Valves

manual or automatic (trip dog) release to vertical (off) position to reverse cylinder movement. The locking position may be rotated 360 degrees.

For more data circle 114 on Reader Service Card

★ ★ ★

STEEL SHELVING IS INSTALLED QUICKLY, WITHOUT TOOLS

Designated as "Klip-Bilt," boltless steel shelving which is designed for fast installation without tools has been announced by The Frick-Gallagher Mfg. Co., Wellston, Ohio. All fastening is with simple clips, making it easy to install by hand quickly. The clips can be readily removed to permit easy rearrangement or disassembly of shelving. To assure maximum carrying load, shelf flange corners are held tight against T-posts at the point of support, thereby preventing flanged corners from pulling away from the post and

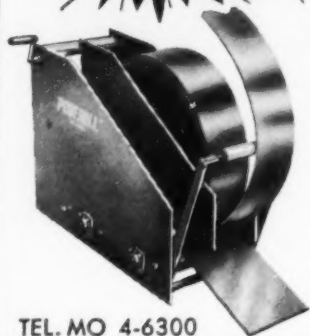


Frick-Gallagher "Klip-Bilt" Steel Shelving

sagging when the shelf is fully loaded.

Consisting of hardened cadmium-plated threaded stud and two heavy formed steel clips, the shelf clips are said to automatically accommodate variations in T-post thicknesses so shelves are always gripped pressure tight — neither too loose without end panel or too tight with panel. Other

30%
40%



TEL. MO 4-6300

POWEROLL SAVES LABOR! SAVES MONEY!

THIS **NEW** POWERED MEDELTON CRADLE IS DESIGNED FOR GREATER EFFICIENCY AND SAFETY IN THE HANDLING OF COIL STOCK

\$280.00

F.O.B. N.Y.
800 LBS. CAP.

\$367.00

F.O.B. N.Y.
2000 LBS. CAP.

- Roll on your coil and it's ready to go.
- Screw operated separator plate.
- No lifting, no pull, no accidents.
- Slack loop permits faster feeding.
- No drag on feed or dies. Eliminates pull, operator fatigue and spoilage.

Phone or write for new folder • Dealer inquiries invited.

WM. HALPERN & CO., Inc.

MACHINE TOOLS

General Offices

100 STEVENS AVE., MOUNT VERNON, N. Y.

For more data circle 535 on Reader Service Card

new shop equipment . . .

clips used for fastening include back panel clips, which are installed from the front of the shelving, and shelf divider clips, which lie flat and do not interfere with storage above or below the shelf. Label holders are fastened with dart clips. For added strength, the shelves are reinforced to accommodate a variety of loads from average

to extra heavy. The shelving is available in a complete range of standard sizes and parts.

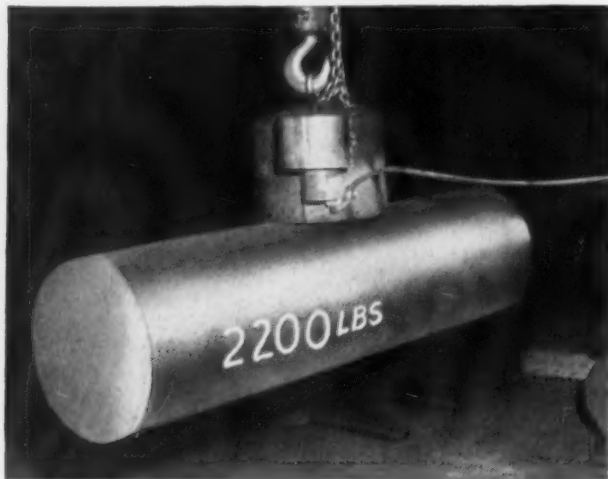
For more data circle 115 on Reader Service Card

★ ★ ★

ATTACHMENT AFFORDS GRINDING OF ENCLOSED CONTOURS ON JIG GRINDER

Enclosed contours, including sharp corners, key slots and other forms, can

be ground on the Moore No. 2 Jig Grinder with a horizontal - spindle slot grinder attachment, available as an accessory from Moore Special Tool Co., Inc., 730 Union Ave., Bridgeport 7, Conn. The slot grinder can be substituted for the vertical - spindle grinding head to perform these operations, adding substantially to the capabilities of



Walker Does It Again - -

The strongest lifting magnet pound-for-pound ever made. Complete saturation . . . maximum efficiency . . . minimum wattage.

Shown here—WALKER magnet lifting, with 12" line contact, solid steel cylinder 13.5" diameter, weighing 2200 pounds, and utilizing about the same wattage as your kitchen lamp.

WALKER magnets lift up to 50,000 pounds.

O. S. WALKER COMPANY INC.

Worcester 6, Massachusetts

For more data circle 536 on Reader Service Card



Moore Slot Grinder Attachment mounted on a Moore Model No. 2 Jig Grinder

the machine. Although the horizontal spindle axis is nominally normal to the travel of the outfeed slide, its rotatable mounting permits any other desired angular relationship. Such a requirement may arise because of obstructions in the contour which necessitate "cocking" the wheel, or because draft must be ground in the side of a slot.

A slide, integral with the mounting element of the slot grinder attachment, is said to provide for axial adjustment of the wheel position so that it can be set radial to, or offset from, the main spindle axis. This adjustment is necessary in centralizing angles dressed on the wheel face and for dressing a wheel to grind a slot central in the bore of a hole. The attachment is motor and V-belt driven and accommodates unmounted wheels from $\frac{7}{8}$ to $1\frac{1}{2}$ inches in diameter. Spindle speeds are from 18,000 to 22,000 revolutions per minute.

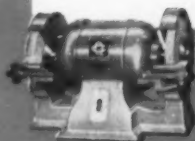
For more data circle 116 on Reader Service Card

★ ★ ★

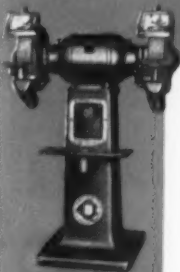
SURFACE GRINDER HAS CONVENIENTLY GROUPED CONTROLS

Designated as the "Grindmatic" Model 545, a wet automatic surface grinder which is compactly designed with conveniently grouped controls at easily accessible sight and hand levels has been announced by Lempco Industrial, Inc., Bedford, Ohio. Work can be secured with the conventional industrial holding fixtures or with the use of a magnetic chuck which is offered as optional equipment. The design of the machine is said to provide maximum work visibility at all times, allowing inspection for finish and accuracy without the necessity of removing the workpiece from the machine or disturbing the grinding cycle. According to the manufacturer, all backlash is eliminated in the feed mechanism of the grinding wheel by a pneumatic counterbal-

**Save
up to
30%**



**Heavy Duty
Bench Grinder**



**Heavy Duty
Floor Grinder**

**cost
less
to own
and
operate**

Queen City

grinders and buffers

So good they're guaranteed: "try one for 30 days . . . if you're not satisfied, return it." It makes cents . . . and dollars . . . to buy equipment like that at prices 20 to 30% under competing makes!

The complete range of Queen City Grinders and Buffers . . . floor and bench types . . . is described in newly-revised literature.

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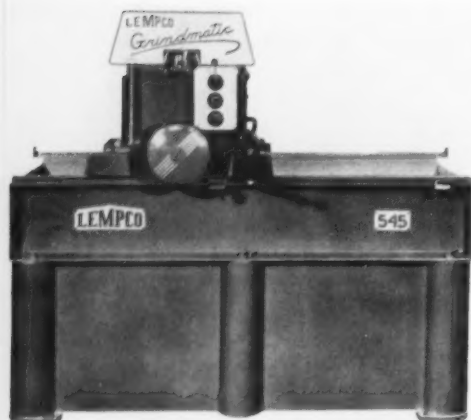
QUEEN CITY MACHINE TOOL CO.

3911 Kellogg Avenue, Cincinnati 26, Ohio

"High Quality—Low Cost—For over 50 Years"

For more data circle 537 on Reader Service Card

new shop equipment . . .



Lempco "Grindmatic" No. 545 Surface Grinder

ance. This device, it is claimed, makes operation practically effortless.

On the standard model, a 3-h.p. motor

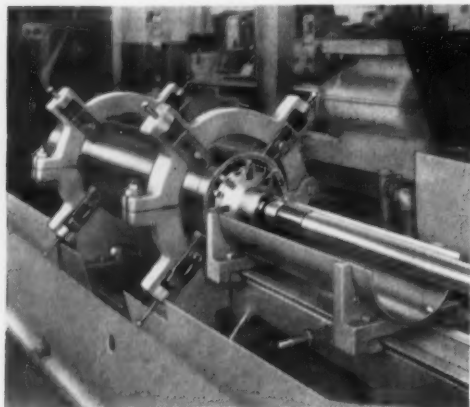
drives the wheel spindle and the 12-inch grinding wheel at a speed of 1,140 r.p.m. The traverse speed rate is fixed at a constant 45 inches per minute, and length of the traverse is controlled by adjustable reversing stops which can easily and quickly be changed. Once the stops are set, the travel over the work is automatic. Flame-hardened and ground ways are said to ensure accuracy. Ample coolant flow is provided by a large capacity pump and a 50-gallon reservoir with a sloping and easily drained sump. The machine has a capacity of handling work measuring 38 inches long x 11½ inches wide x 11 inches high. The machine can also be furnished with various horsepower motors, wheel sizes, traverse speeds and bed lengths.

For more data circle 117 on Reader Service Card

★ ★ ★

TOOL CABINETS AND CHESTS

Four tool cabinet models have been added to the product line of Hout Mfg.



Precision Boring and Honing our Specialty

You can save time and costs by sending your difficult bored and honed requirements to specialists in internal machining. The very latest in equipment and most exacting testing methods assure high quality. Send drawings for estimates.

MANUFACTURERS OF HYDRAULIC CYLINDERS • SPINDLES • SLEEVES
CLUTCH SHAFTS • PISTON RODS • RAMS • QUILLS, ETC.

AMERICAN HOLLOW BORING CO.

1955 Raspberry St.,

Erie, Pa.

For more data circle 538 on Reader Service Card



Co., 550 N. Wheeler, St. Paul 4, Minn. The new additions include the Model 107 "Economy Chest," a four-drawer all-steel chest which measures 26 x 12 $\frac{1}{4}$ x 12 $\frac{1}{4}$ inches. The top drawer of this chest has movable dividers, and the bottom drawer has a socket-holding compartment. The chest has a built-in lock. Two "Super Duty Chests" have also been announced. The Model 108 chest measures 28 x 15 x 21 inches high. One of its six drawers is 5 inches deep, two are 3 inches deep and three are 2 inches deep. The two top drawers have movable dividers, and all drawers have extra large pulls and compound slides. A built-in locking device grips the drawers from the rear. The Super Duty Chest, Model 109, has the same construction features as the Model 108, but has four drawers—one 5 inches deep, one 3 inches deep and two 2 inches deep. The top drawer is compartmented, and overall dimensions are 28 x 15 x 15 $\frac{3}{4}$ inches high.

The fourth unit announced is the



Illustration showing the Huot Model 108 Chest and the Model 275 Cabinet

UNIVERSAL DRILL BUSHINGS OUTLAST THEM ALL!



Superfinish bores reduce wear. Blended radius helps prevent tool hang-up and breakage. 100% concentricity and hardness tests insure accuracy and uniform high quality.

Write for complete information.

**UNIVERSAL
ENGINEERING CO.**

FRANKENMUTH 9, MICHIGAN

180-B

For more data circle 539 on Reader Service Card

new shop equipment . . .

"Super Duty Cabinet," Model 275. This cabinet has two big drawers measuring $23\frac{1}{4}$ x 16 x 6 inches, a lower compartment which measures $24\frac{1}{2}$ x 18 x 11 inches and a locking hide-away front. The cabinet is designed to support either the Huot Model 108 or 109

tool chests. Dimensions of the Model 275 are $28\frac{1}{2}$ x 18 x $31\frac{5}{8}$ inches high. For more data circle 118 on Reader Service Card

★ ★ ★

TEMPERATURE METER

Designated as the "Temp-Check" Model 386H, a portable temperature meter with an unusually wide range

from minus 50 to plus 1,000 deg. F. has been announced by Webber Gage Co., 12899 Triskett Rd., Cleveland 11, Ohio. The meter speeds up precision measurements where temperatures in extreme ranges must be immediately ascertained. Fitted with a sensitive thermocouple, the instrument quickly measures temperatures of metals, liquids and air and is said to eliminate delays caused by waiting for gage blocks or work to re-

FOR "SPECIAL" CUTTERS AT STANDARD

PRICES!

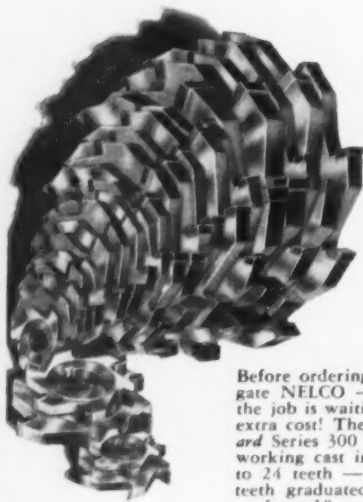


CHECK THE

NELCO

CATALOG!

**NEARLY 800 DIFFERENT
NELCO TOOLS ARE
REGULARLY STOCKED TO
FILL 90% OF ALL SPECIAL
TOOL APPLICATIONS!**



**SEND TODAY FOR
THE NEW NELCO
48 PAGE CATALOG**



Before ordering costly *special* cutters, investigate NELCO — chances are the tool to do the job is waiting — without delay! Without extra cost! There are, for example, 47 *Standard* Series 300 Nelco Side Milling Cutters for working cast iron, brass and bronze. 6 teeth to 24 teeth — diameters from 3" to 12" — teeth graduated from $3/32$ " to 1" in width — from 1" to 2" hole diameter. Throughout the entire Nelco line, this same versatility and utility holds true. Other *standard* Nelco carbide tools in stock — saving dollars on *special* cutters — include

- | | |
|------------------------------------|-------------------------------------|
| 130 Different Side Milling Cutters | 40 Different Face Milling Cutters |
| 37 Different Slitting Saws | 25 Different Shell End Mills |
| 171 Different End Mills | 189 Different Carbide Tipped Drills |
| 21 Different Slab Milling Cutters | |

... and scores of additional cutters for every application

NELCO TOOLS

**For that Extra
EDGE in Production**

NELCO TOOL COMPANY, INC., MANCHESTER, CONNECTICUT

For more data circle 540 on Reader Service Card



**Webber "Temp-Check" Model 386H
Temperature Meter**

turn to normal temperature. A quick calculation from the meter reading tells exact dimensions.

The temperature meter operates on a flashlight battery and is completely portable.

For more data circle 119 on Reader Service Card

★ ★ ★

TRANSFER MACHINE BORES, CHAMFERS AND FACES CYLINDER BLOCKS

A transfer machine which utilizes two 3½ x 24 round bar way units and which performs precision boring, chamfering and cross-feed facing operations on cylinder blocks and flywheel housing assemblies has been announced by Baker Brothers, Inc., Toledo, Ohio. The machine is arranged to handle either conventional or automatic transmission housings automatically. The

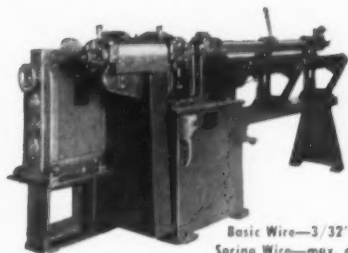
units used on the machine utilize heavy-duty enveloping-type worm and worm gear drives with cross feed facing heads. Each unit is driven by a 10-h.p., d.c. motor wired through Reliance C-10-US variable speed drive control cabinet coupled with an automatic rheostat, mechanically activated, to maintain cutter foot speed uniformly throughout varying diameters of cut.

Mounted opposite the 3½ x 24 units are two Baker 3 x 12 units for spot-facing.

The workholding fixture is a hydraulically actuated transfer mechanism arranged for handling two parts at work stations and three parts idle. The transfer mechanism picks up assemblies from the index table which has rotated them 90 degrees from the conveyor line, elevates them, moves 24 inches horizontally and then lowers the assemblies into clamping and working

MOVE INTO THE *Automation Age* *with the* **NEW SHUSTER 1 AV**

WIRE STRAIGHTENING & CUTTING MACHINE



Basic Wire—3/32" to 1/4"
Spring Wire—max. dia. 1/8"

**New Electrically-Controlled Clutch and Target Increases
Efficiency and Production. No price advance!**

Geared to feed any speed from 50 to 200 feet per minute!

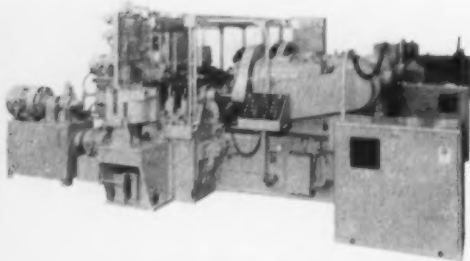
• Immediate selection of appropriate rpm • Suitable for many sizes, alloys, tempers • Simple, economical operation • Trouble-free maintenance • On-the-job adjustment compensates for any variation in wire coil. • There is a SHUSTER for every wire straightening and cutting job from .025" to 11/16" diameter.

METTLER MACHINE TOOL, INC.

157 ADELIN ST., NEW HAVEN, CONN. • N. Y. Office: Eleven Broadway, Whitehall 4-5480

For more data circle 541 on Reader Service Card

new shop equipment . . .



Baker Four Unit Transfer Machine for cylinder blocks and flywheel housing assemblies

position. The machine is arranged so that one 3½ x 24 and 3 x 12 unit may be set up to run conventional transmission block and housings and the other 3½ x 24 and 3 x 12 unit to run automatic transmission block and hous-

ings simultaneously. Through skip indexing and call switches, it is claimed to be possible to run both conventional and automatic parts at random.

For more data circle 120 on Reader Service Card

★ ★ ★

**HYDRAULICALLY OPERATED
PRESS BRAKE FEATURES
"STROKE CONTROL"**

O'Neil-Irwin Mfg. Co., 576 Eighth Ave., Lake City, Minn., has announced the Di-Acro Hydra-Power Press Brake which is said to develop 12 tons of pressure and which has a 36-inch length of bed and ram. According to the manufacturer, the most important advantage of the machine is "stroke control." The most practical length of stroke for each job can be preset, and the ram can be stopped or reversed at any desired point in a work operation.

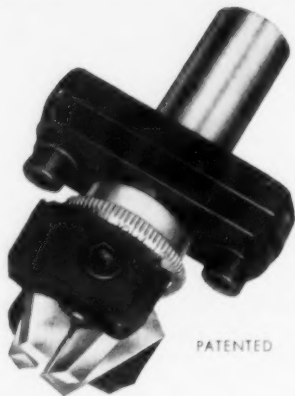
**KUTMORE ADJUSTABLE
HOLLOW MILLS**

A MIGHTY MIDGET!

This Midget Floating Holder Hollow Mill, flange type, has micrometric adjustment, and is designed to permit easy compensation for any spindle misalignment. Small, sturdy, extremely accurate!

**WRITE TODAY FOR
CATALOGUE No. 20-BB**

It shows complete line of adjustable hollow mills. Our Engineering Dept. is at your disposal for special requirements.

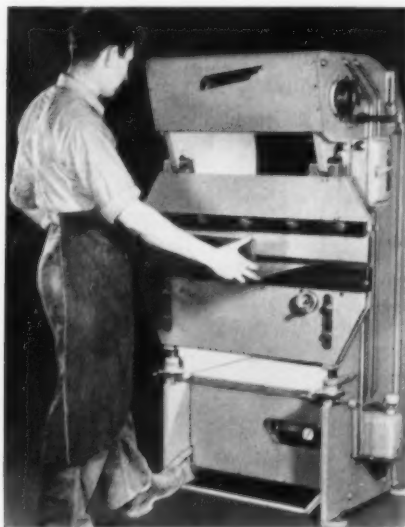


CARL WIRTH & SON, INC. 1625 CLINTON AVE. NO.
ROCHESTER 5, N. Y.

For more data circle 542 on Reader Service Card

Power is applied to a rotary hydraulic cylinder which is mechanically linked to the camshaft. The oscillating action of this cylinder has a maximum movement of 270 degrees. It is claimed that maximum power or pressure is obtained by working off the bottom of the stroke. The design of the machine is such that any length of stroke can be secured with a quick adjustment of a stroke control selector, without having to readjust the bed or die settings.

A bending cycle is completed in the forward movement of the hydraulic cylinder and another cycle is completed in the return movement of the cylinder. The opening need only be adjusted for slightly more than the thickness of the material. A production rate of 60 strokes per minute is said to be possible on a 1/4-inch stroke, and at the full 1 1/2-inch opening, a rate of 24 strokes per minute can be maintained. Although a greater number of strokes per minute can be attained with a short stroke, the ram speed remains



Di-Acro Hydra-Power Press Brake in use



**MASTER TOOL MAKERS SAY
they save up to 50% with**

the REGENT

DUPLICATOR TABLE

in the production of

- Plastic, Rubber and Glass Molds
- Forging and Die Cast Dies
- Punches, Contoured Parts

MOUNTS ON ANY BRIDGEPORT MILLING MACHINE

- DUPLICATE any shape
2 or 3 dimensional with ease
- Capacity 6" x 6"
ratio 1 to 1 with master
- Single lever table control
for ease of operation
- Table floats on precision balls
- Mounts on mill in matter of minutes

Write for descriptive literature

J. M. KALINS & COMPANY

115 East Washington Ave., Bridgeport 8, Conn.

For more data circle 543 on Reader Service Card

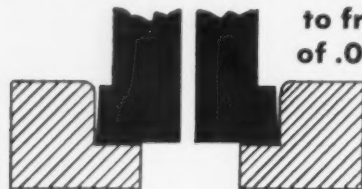
new shop equipment . . .

constant whether the stroke is short or long. Because of the constant ram speed, it is claimed to be possible to form materials at a high rate of production with safety, since the material will not "whiplash." Standard equipment on the press brake includes an

adjustable back gage which is adjustable both vertically and horizontally. A micrometer-type front operated back gage is available as an accessory. A complete line of press brake dies can be supplied in lengths ranging from 6 to 36 inches in 6-inch increments. These dies are standard press brake dies and will fit all other press brakes.

For more data circle 121 on Reader Service Card

COUNTERBORES and BLIND HOLES now easily gaged



to fractions
of .0001"



Unique 2-point gaging at tip measures to very bottom of shoulder or hole.

Because it is a UNIQUE expanding plug gage, Comtorplug easily gages inside splines that are difficult for other contact types of gages.

COMTORPLUG with interchangeable expanding plugs to gage simple or special bores from $\frac{1}{8}$ " to 8" dia.

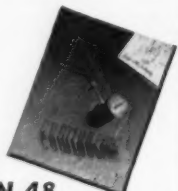
Unique Advantages

- Positive gaging accuracy to fraction of .0001" regardless of who operates it.
- Indicates actual size, a fixed—not passing—reading.
- Positive 2-point gaging—automatic centering.
- Shallow holes, deep holes, inside splines, open-end holes gaged easily.
- Detects ovality, back or front taper, bell mouth, barrel shape.
- Reaches to bottom of blind holes.
- Gages work while still held in chuck.
- A shop tool for all-day every day use.
- Portable—no wires, hoses or stands.

Investigate the gage used by the thousands in jet engine, automotive transmission, household appliance, farm machinery, guided missile and other volume-precision plants. IT MAKES PRECISION GAGING EASY . . . at machine . . . at inspection bench . . . for selective assembly. No other like it—investigate and see why.

COMTOR COMPANY

64 Farwell St.
WALTHAM 54,
MASS.



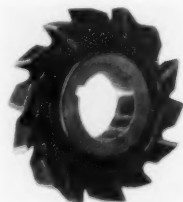
GET THE FACTS—REQUEST BULLETIN 48

For more data circle 544 on Reader Service Card

★ ★ ★

WOODRUFF KEYSEAT CUTTERS

Quality Tool Works, 792 Market St., Waukegan, Ill., has announced a complete line of arbor-type staggered-tooth Woodruff keyseat cutters. According to the manufacturer, standard sizes are available in diameters ranging from $2\frac{1}{8}$ through $3\frac{1}{2}$ inches and in widths ranging from $\frac{3}{16}$ through $\frac{3}{4}$ inch. The cutters are regularly



Quality Staggered-Tooth Woodruff Keyseat Cutter

furnished with the diameter $1/32$ inch larger than the nominal dimension specified to allow for resharping. Tolerances are said to conform to A.S.A. standards.

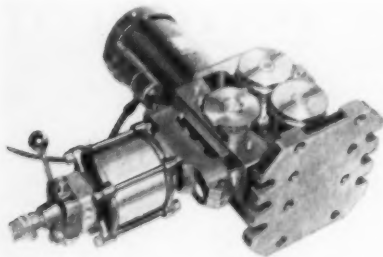
For more data circle 122 on Reader Service Card

★ ★ ★

CENTERING TOOL AFFORDS ABSOLUTE CONCENTRICITY

Designated as the St. Mary's "Spin Roll," an all-purpose universal centering tool which is designed to achieve absolute concentricity for all metal components from practical zero up to 1.250 finished diameters without the use of collets or chucks has been announced by The Pivot Punch and Die Corp., Dept. MM, North Tonawanda, New York.

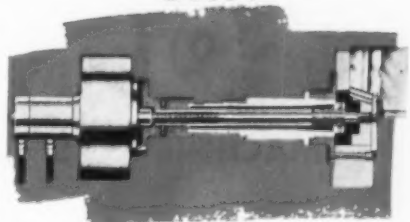
Fully automatic, the unit is said to be self-centering and self-adjusting to uniform diameters, lengths, speeds and feeds because the surface speed is constant. According to the manufacturer, absolute concentricity is achieved through a series of synchronized interlocking rollers, driven by a motor. The workpiece rotates on its own diameter between the "Spin Rolls" while secondary diameters are generated. Every inside or outside diameter is concentric to all other diameters in the same plane. Used as either a machine accessory or as a self-combined bench



St. Mary's Automatic "Spin Roll" Centerer

June, 1955

NEW SKINNER "JUNIOR" POWER CHUCKING UNIT



Now! Maximum production speed for your small lathes too!

This Skinner "Junior" unit can be adapted to almost any small lathe with $1"$ to $1\frac{3}{8}"$ hole through the spindle. It is light in weight, precisely balanced to minimize spindle bearing and braking loads, and provides extreme repetitive accuracy on internal and external work.

The Skinner 8" self-centering power chuck has gripping capacity from $\frac{1}{4}"$ to 6". Its $\frac{1}{4}"$ jaw travel exceeds the capacity of any collet, and is particularly valuable on production work where rough or finished holding diameters may vary beyond a single collet's ability to grip.

The Skinner "Junior" unit is complete. It contains chuck, 6" aluminum air cylinder, adapters, draw bar, etc.

Write Skinner or your nearest Skinner distributor for illustrated folder.



THE SKINNER CHUCK COMPANY

210 Edgewood Avenue, New Britain, Conn.
For more data circle 545 on Reader Service Card

modern machine shop 303

new shop equipment . . .

unit, the tool is claimed to be readily adaptable for all rotary machining and grinding operations.

Light in weight and easily portable, the unit can be easily attached in either a vertical or horizontal position. Change-over from one size work to

another requires only one quick adjustment. Overall dimensions of the unit are $8\frac{3}{4} \times 9\frac{5}{8} \times 17$ inches, including the 1/6-h.p., 110-volt, single-phase capacitor motor. The pressure roll is manual or automatic, and accessories available include air gage, pressure reducer, valve station and quick coupler. The compressed air requirement is 20 pounds minimum line pressure.

For more data circle 123 on Reader Service Card

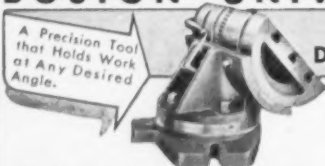
For more data circle 546 on Reader Service Card

★ ★ ★

HOLDER IS DESIGNED FOR STAMPING ENDS OF ROUNDS

Stamping on ends of round bars, shafts and tubular sections is claimed to be simplified by the Model RSCL Curved Line Holder developed by M. E. Cunningham Co., 1051 Chateau St., Pittsburgh 33, Pa. The unit can be supplied with or without a gage which enables the operator to position the holder quickly so that all parts will be marked in an identical position. In stamping solid bars or shafts, practically any size can be marked with the same holder. For tubular parts, the radius of the type circle can be arranged to suit several sizes within a limited range. A special feature of the holder is a snap-slide type-retaining device. When the slide is opened, the retaining bar drops out of slots in the type, allowing it to be changed quickly and easily. When the slide is closed, a

BOSTON UNIVERSAL ANGLE PLATE



A Precision Tool
that Holds Work
at Any Desired
Angle.

**Puts Speed and Profit into Angular
Drilling, Milling, Planing, Shaping, Grinding**

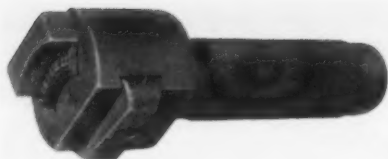
With a Boston Universal Angle Plate on the job, work is quickly set up on the table and but a few seconds are required to locate it at the desired angle. Indispensable in tool rooms and extremely useful in production runs, the Boston Universal pays for itself many times over by eliminating the necessity of expensive jigs and fixtures.

Made in several stock sizes. Write today for full information.

US AUTOMATIC BOX MACHINERY CO., Inc.

**10 ARBORETUM RD.
BOSTON 31, MASS.**

For more data circle 547 on Reader Service Card



Mecco Model RSCL Curved Line Type Holder

wedge arrangement lifts the retaining bar up into type slots, securely locking type in the holder.

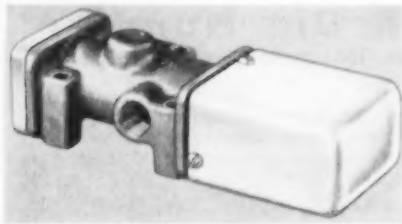
The Model RSCL utilizes a round knurled handle for positive grip. It is made of non-spalling and non-mushrooming Mecco Safety Steel and can be produced in almost any size or capacity of type.

For more data circle 124 on Reader Service Card

★ ★ ★

THREE-WAY VALVE FOR MANUAL OR ELECTRICAL CONTROL

The Bellows Co., Akron 9, Ohio, has expanded its heavy-duty "Bel-Air" valve line to include a three-way series, as well as the four-way model. The standard three-way model is made in sizes of $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{1}{2}$ inch for manual or electrical control. The solenoid-controlled, pilot-operated model offers a choice of 115, 230 or 440-volt operation. The same solenoid is used on all sizes. The mechanically actuated model can be furnished in hand lever, cle-



Bellows Heavy-Duty "Bel-Air" 3-Way Valve

June, 1955

**HIGHER SPEEDS!
FASTER GRINDING!**

kipp

AIR GRINDERS

MODEL JA
50,000 R.P.M.

\$42⁰⁰
IN U.S.A.



Weight 12 ounces;
length 6 $\frac{1}{4}$ inches;
chuck size $\frac{1}{4}$ inch.
Wheel guard removed
for better illustration.

The RPM's stay up while grinding . . . not only when the grinder runs idle. That means better work—longer wheel life.

High speed grinding with small wheels was a Madison-Kipp development of the late twenties. It was born out of a pressing need in our tool room. Because tool room grinding problems are universal, we believe it will pay you to utilize Kipp grinders in your tool room as generally as we do in our own.

kipp

MADISON-KIPP CORP.

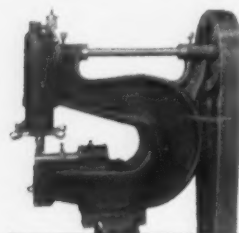
208 Waubesa St., Madison 10, Wis., U. S. A.
For more data circle 548 on Reader Service Card

modern machine shop 305

new shop equipment . . .

vis, roller, foot pedal and treadle types. All actuators are readily interchangeable between valves of similar size. A torsion spring in the lever bracket returns the valve when pressure is released. This spring is easily removed when spring loading is not desired.

SAVAGE NIBBLING MACHINES



NOW TUBE CUTTING ATTACHMENTS for ANY SIZE SAVAGE NIBBLING MACHINE

For slotting, cutting off and forming special ends. Cutting by guide lines or template.

Capacity in tube wall thickness to one half rated capacity of Nibbler.
Tube sizes from 1" I.D. to 3 1/2" O.D. Larger diameters for lighter gauges.

Quotation on Request

"NIBBLE YOUR COSTS"

W. J. SAVAGE COMPANY
Knoxville Since 1885 Tennessee

PIONEER MFRS. OF NIBBLING MACHINES

For more data circle 549 on Reader Service Card

The valve body is of cast bronze. Inserted into the body is a series of polished, chrome-plated liners. These stationary liners are separated by protective bronze screens and are sealed to the valve body by O-rings. An aluminum spool slides freely on jumbo O-rings within the polished liners. This lightweight spool is the only internal moving part, which results in unusually low friction and ease of operation.

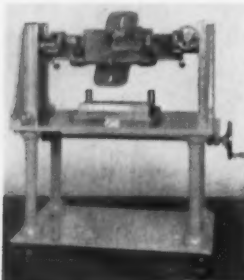
For more data circle 125 on Reader Service Card

★ ★ ★

AIR FEED FOR USE ON WALKER-TURNER DRILL PRESSES

An air feed which is designed to fit the head of any W-T type of drill press having up to 6-inch spindle travel has been announced by Walker-Turner Division, Kearney & Trecker Corp., Plainfield, N. J. According to the manufacturer, the unit can be installed in approximately 10 minutes without need for machining or making electrical connections. The feed, it is claimed, will not interfere with the normal function, swing or position of the machine. The unit incorporates a pneumatic micro-valve which imparts to the spindle the desired sensitive, automatic feed-and-retard action for a variety of continuous production operations. In special cases, a hydraulic check valve is available as an accessory.

By means of a check valve and a



HAUSER Die Handler

For tool rooms, inspection, press and try-out departments.

Mobile or stationary. 180 degrees rotation of punch. Locks in any position. 24" x 40" base table. Ball bearing construction.
Dealer inquiries invited.

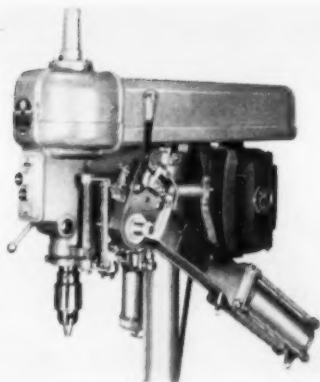
WRITE FOR DETAILS

HAUSER MFG. CO.

234 MILL STREET
ROCHESTER 14, N. Y.

**\$987 F.O.B.
FACTORY**

For more data circle 550 on Reader Service Card



Walker-Turner Air Feed Unit installed

series of set screw adjustments, the rate of feed may be controlled to fit the job at hand, including checking and slowing down the spindle at several points as well as at the drill's break-through point. Release of a

valve-stop reverts the air feed to single cycle operation, and the removal of two plugs from the air cylinder head converts it for conventional hand operation. The manufacturer states that the accuracy of feed will hold indefinitely within 0.003 inch. Feed pressure at the drill point averages 14 times greater than the air pressure. Air pressure may be regulated to suit production requirements.

For more data circle 126 on Reader Service Card

★ ★ ★

SMALL MEASURING MAGNIFIER USES REAL GLASS RETICLE

Edmund Scientific Corp., Barrington 3, N. J., has announced the Edscorp Jr., a "vest-pocket" size version of its pocket comparator, which utilizes a real glass reticle. The reticle pattern is etched in the glass, and the etching is filled with pigment to make reading

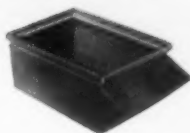
STERLING "TOP RIM" CONSTRUCTION MAKES THE BIG DIFFERENCE

● Our "TOP RIM" construction provides stronger support all around the box—no corner inserts to come loose and fall out. We invite comparison in design, construction and price.

Efficiency in designing and manufacturing allows us to quote favorably on any type or size stacking box.

**WRITE FOR LITERATURE
AND PRICES.**

Sterling Factory Equipment Co., 183 Charles St., Providence, R. I.



Sterling Bin, Front "Top Rim" Steel Stacking Box. Size 18" x 12" x 6".

Sterling "Top Rim" Steel Stacking Box with drop handles. Size 18"x12"x6".



Sterling

Quality Handling & Storage Equipment



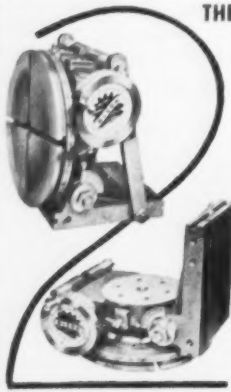
For more data circle 551 on Reader Service Card

new shop equipment . . .

easier. According to the manufacturer, the glass will not bend or warp, thus eliminating the possibility of damage or error in measuring. The reticle pattern of the junior measuring magnifier is designed to compare hole diameters, as well as take linear measurements.



Edscorp Jr. Measuring Magnifier in use



THE TWO IN ONE

COMBINATION
ROTARY TABLE
AND
ANGLE PLATE

PRECISION
ACCURACY

WORM adjustable from
0 to 90
degrees.

VERNIER
control to
within

WRITE FOR FOLDER 2 seconds of Arc.

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For more data circle 552 on Reader Service Card

The reticle features a thickness comparison scale, comprising a series of parallel lines 0.002 to 0.007 inch apart, making it possible to measure directly the thicknesses of sheet materials.

The linear scale is given in both millimeters and decimal inches. The millimeter scale is 10 mm. long, subdivided into units of 0.2 mm. The decimal inch scale is 0.5 inch long, subdivided into units of 0.005 inch. Hole diameters are given in fractions from 1/64 to 1/16 inch and in decimals from 0.005 to 0.050 inch. Both the reticle and the object to be measured are magnified six times. The magnifying lens is said to be accurate to the edge of the field. Light is admitted to the object and the reticle through the transparent Lucite

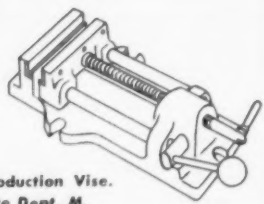
INSTANT ACTION
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RAPIDSET
All Purpose Tool Room And
Machine Shop Vises.

**The
JAWSET**

Adjustable Pressure Production Vise.
For Information Write Dept. M.



Hartmann Mfg. Co., 1637 Gould St., Racine, Wis.

For more data circle 553 on Reader Service Card

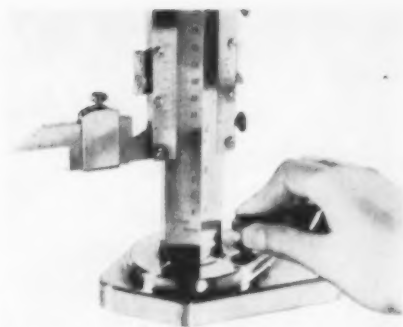
walls of the reticle cell. The complete unit measures only 2 inches long x 1 inch in diameter. It can be focused and locked in position to suit the user.

For more data circle 127 on Reader Service Card

★ ★ ★

HEIGHT GAGE FEATURES TRIANGULAR SCALE BEAM

George Scherr Co., Inc., 200-MM Lafayette St., New York 12, N. Y., has announced the Chesterman Height Gage which utilizes a triangular scale beam that provides for maximum strength and rigidity, preventing sway and vibration. The sliding head of the gage moves through its entire range by the action of a full-length, large diameter screw in the rear of the beam. The engaging nut is split and is disengaged for quick approximate setting of



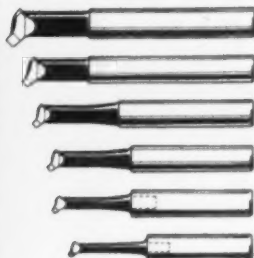
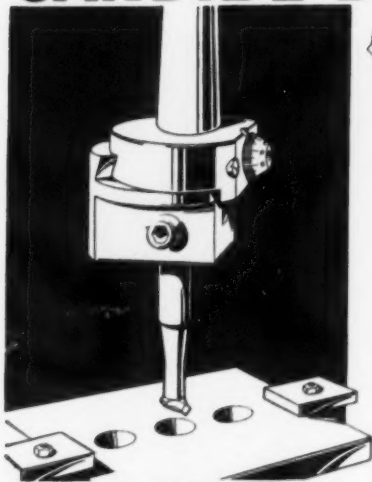
Chesterman Triangular-Beam Height Gage

the head simply by pressing the two lugs on the sides and sliding the head along the beam.

One of the principal advantages of the gage is said to be the location of the fine adjustment screw in the base. In making fine adjustments, the down-

★ ★ ★ ★ ★

CARBIDE BORING TOOLS



three

DISTINCTIVE STYLES

- for boring
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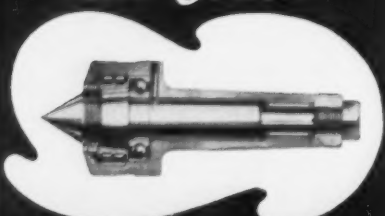
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784 No. Broadway
White Plains, N. Y.

For more data circle 554 on Reader Service Card

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Heavy Duty Live Centers



Adapted for heavy duty work. Precision type ball and roller bearings assure maximum capacity for high speed production and long service.

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M on live centers

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RUST-LICK "B"

For use wherever water comes in contact with Ferrous Metal.

STOPS RUST IN

Hydrostatic-Pressure Testing
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BOSTON 16, MASS

For more data circle 556 on Reader Service Card

310 modern machine shop

new shop equipment . . .

ward pressure on the screw helps to hold the gage firmly to the surface plate, minimizing the tendency of the gage to tilt or move. The vernier is 2.450 inches long. Verniers are adjustable, and the accuracy of the setting may be checked by the use of a master gage block which is furnished with the gage.

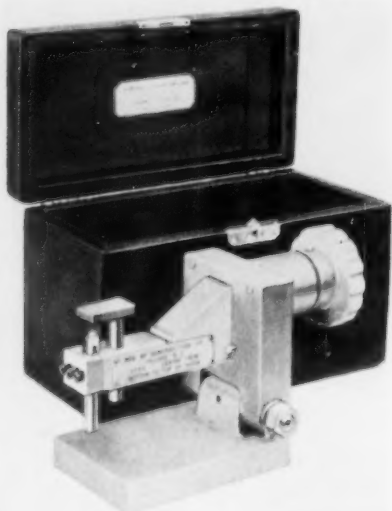
A large, solid base, heavy enough to prevent tilting or toppling over, is said to assure high stability and accuracy. The gage is available in sizes of 12, 18, 24, 40 and 48 inches.

For more data circle 128 on Reader Service Card

★ ★ ★

WHEEL DRESSER MAINTAINS ACCURACY OF 0.0002 INCH

Identified as the Model "SS," a wheel dresser which is designed for ac-



Somerset Model "SS" Grinding Wheel Dresser

June, 1955

curately dressing grinding wheels of most diameters has been announced by Somerset Tool Co., 320 Virginia St., Hillside, N. J. According to the manufacturer, the wheel dresser maintains an accuracy of 0.0002 inch. Simple to operate and maintain, the dresser is claimed to be unusually durable. Four stops allow complete control for the dressing of concave or convex radii.

For more data circle 129 on Reader Service Card

BASIC VALVE ASSEMBLY IS ADAPTABLE TO FIVE DIFFERENT WAYS

Mead Specialties Co., Dept. SV-42, 4114 N. Knox Ave., Chicago 41, Ill., has announced the "300 Series" of four-way 1/4-inch valves in which the same basic assembly can be used as a spring return hand valve, a spring return foot valve, a self-locking bench valve, a

★ ★ ★ ★ ★



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inspection
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catalog on request.

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TOOL ROOM Fabrication of jigs and fixtures with critical locations of holes and compound angle surfaces.

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SOUTH GATE, CALIFORNIA

PRECISION GAGING EQUIPMENT

For more data circle 557 on Reader Service Card

new shop equipment . . .

spring return cam valve and a solenoid-actuated valve. According to the manufacturer, the simple, rugged construction of the valves offers dependable performance. Easy maintenance and parts replacement plus interchange-

"This Seems Worth Looking Into"
GEM VISES
"Standard of Efficiency"



Complete range of sizes for all Machines. Plain, Swivel & Tilting.
 Write for complete information.

J. E. MARTIN MACHINE CO.
 PRR AND STATE SPRINGFIELD, OHIO

For more data circle 558 on Reader Service Card

SLASH Production Costs with HIGH SPEED HAMMER!

40 Years of Know-How . . .
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ASSEMBLY PROBLEMS? Let High Speed help find the solutions. Unique engineering and tooling service yours without cost. Send samples of job to be assembled and/or prints. Complete analysis by return mail.

Or, ask for full information on High Speed Staking Machines and Riveters. Full range of models, bench and pedestal types, motor, foot or air operated. Wire or call today!



Write or Call Congress 6470 Today!

HIGH SPEED HAMMER CO., INC.
 315 Norton St., Rochester 21, N. Y.

For more data circle 559 on Reader Service Card

312 modern machine shop



Illustration showing the five different methods of operation available by using the Mead 1/4-Inch "300 Series" Basic Valve Assembly

ability of actuating lever is another important feature.

The valves also have built-in speed control. By regulating the size of the exhaust openings in the valve, it is easy to control the speed of a double-acting cylinder in both directions. This is said to be easily accomplished by adjusting the twin set screws below the actuating lever. Limiting the return travel of the plungers limits the exhaust openings. The valve base and body is an aluminum casting, and seals are Neoprene. Springs and plungers are all rustless brass, bronze or stainless steels.

For more data circle 130 on Reader Service Card

STANDARDIZED MICRO DRILL GUIDES

All standard body styles available with hole sizes from #80 to 3/32". Tolerances of .0002 maintained on I.D., O.D., and concentricity.

ENGINEERED MICRO-TOOLING, DRILLS, JIGS, COLLETS, ETC.

**MICRO
DRILL
GUIDE**



3980
Superior Ave.
Cincinnati 36,
Ohio

For more data circle 560 on Reader Service Card

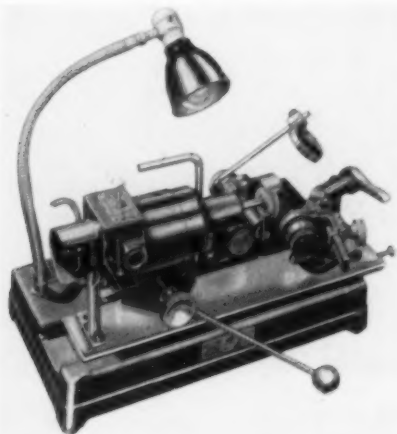
June, 1955

REDESIGNED DRILL GRINDER PRECISION POINTS STANDARD DRILLS

Dumore Precision Tools, 1311 Seventeenth St., Racine, Wis., has announced the redesign of its drill grinder, designated as the Series 21, incorporating more than 20 changes and improvements. The improved grinder is said to be ideal for precision pointing standard drills or reclaiming broken or worn drills, resulting in more accurate holes.

The operation of the grinder is said to be unusually simple. It sharpens two-flip, right-hand drills easily and accurately, and drills can be ground quickly. Compact in size, the machine is designed to stand on any small bench or table, and it is easily portable from one location to another, weighing only 40 pounds.

Drill sizes from No. 70 up to $\frac{1}{4}$ inch in diameter can be ground to point angles from 90 through 150 degrees. Clearance angles can be selected and quickly changed from 5 to 15 degrees. Incorporating a $\frac{1}{5}$ -h.p., a.c./d.c. universal motor, the drill grinder swings a



Dumore Series 21 Redesigned Drill Grinder

June, 1955

DEPENDABLE ACCURACY



INSPECTION TOOLS made of MEEHANITE METAL are designed to fill your various Inspection and Checking needs. Sturdily constructed to give you reliable, accurate service.

Surface Plates — Box Parallels
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Toolmaker's Knees — "V" Blocks
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Angle Attachments

Send for Bulletin

ACME TOOL CO.

73 W. Broadway, New York 7, N. Y.

For more data circle 561 on Reader Service Card
modern machine shop 313

4 Reasons why you should use **GAMMONS DIE REAMERS**



Specially treated for today's modern die steels.



Rapid cutting capacity.



Tapers per inch .005, —.008, —.013 in stock.



Large range of standard sizes in stock at all times for your convenience.

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GAMMONS • HOAGLUND CO.

MANCHESTER 2, CONN.
Manufacturers of helical taper pins, chucking,
die makers and special reamers.

For more data circle 562 on Reader Service Card

314 modern machine shop

new shop equipment . . .

2-inch diameter dual-grit grinding wheel. The medium and fine-grit halves of the wheel permit the sharpening of large and small diameter drills with minimum wheel breakdown and elimination of drill burning. Added features include a web-thinning wheel, roughing wheel, magnifying glass, diamond wheel dresser and adjustable spotlight. For more data circle 131 on Reader Service Card

★ ★ ★

CONTOUR PROJECTOR PERMITS QUICK, ACCURATE INSPECTION

Designated as the No. 14, a contour projector which is designed to permit quick, economical precision inspection right in the shop has been announced by Covel Mfg. Co., Dept. C-2, Benton Harbor, Mich. According to the manu-



Covel No. 14 Precision Contour Projector

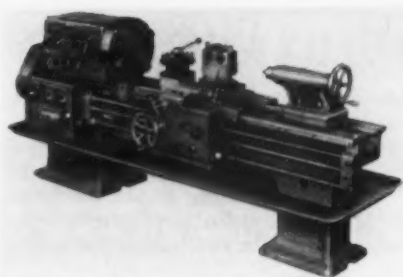
June, 1955

facturer, the optical comparator is a complete checking instrument which provides accurate measurement of difficult dimensions. It is simple to operate, all measurements being taken by direct readings from precision-built indicators. The comparator has a large work capacity, sturdy construction and an optical arrangement which permits it to be used in bright light in the shop. The optics are precision ground and coated to provide unusual accuracy and bright, halo-free images. The projector is shipped complete, ready to operate. For more data circle 132 on Reader Service Card

★ ★ ★

HIGH-SPEED LATHE FEATURES VARIOUS SAFETY DEVICES

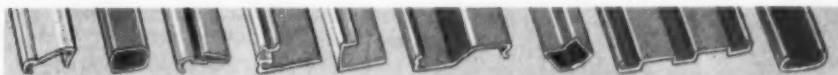
Designated as the Model D L N E, a high-efficiency high-speed lathe which incorporates various safety devices for



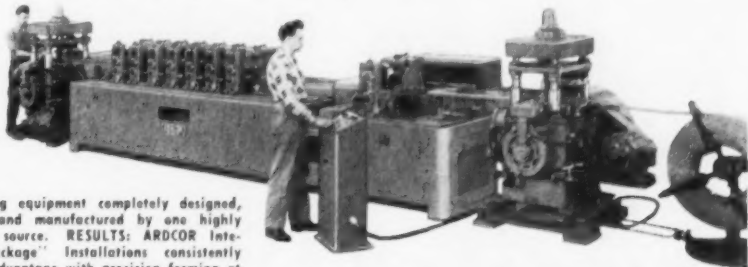
Weisser Model D L N E High-Speed Lathe

full protection against accidents has been announced by The Weisser Corp., Linden, N. J. The face plate and dog plate are equipped with a slip safety device. The bed has diagonal ribbing, rigid construction and good chip flow. Hardened and precision ground gear wheels are claimed to assure quiet running.

The machine utilizes a Norton gear-



ARDCOR 1 1/2-F ROLL FORMING MACHINE with two 30-TON ARDCOR PRESSES performing pre-notching and cut-off operations.



Roll Forming equipment completely designed, engineered and manufactured by one highly experienced source. RESULTS: ARDCOR Integrated "Package" installations consistently prove this advantage with precision forming at modern high speeds—better roll formed products! Consultation without obligation.

ARDCOR ROLL FORMING MACHINES



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DESIGNERS AND MANUFACTURERS: All Sizes and Spindle Diameters of Roll Forming Machines, Welded and Lock-Seam Tube Mills • Forming Rolls, Tubing and Pipe Rolls • Straightening, Pinch and Leveler Rolls • Cut-off Machines

For more data circle 563 on Reader Service Card

new shop equipment . . .

box, which provides 177 standard metric, whitworth, modulus and diametrical pitch threads, and coarse and multiple thread cutting attachments are furnished. According to the manufacturer, the apron features automatic release of longitudinal and transmission



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"C" CLAMPS

Also bar clamps, hinged clamps, spring clamps, etc.

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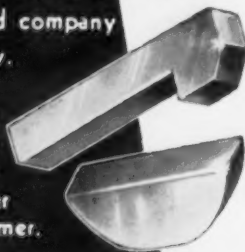
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KEY SPECIALISTS

30 years of customer satisfaction based on a superior product, reasonable pricing, delivery dependability, and company reliability.

Always able to satisfy another customer.

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FEATHER
GIB HEAD
TAPERED
SPECIAL**



Dept. 6

Write for literature

STANDARD AUTOMOTIVE PARTS CO.
664 NIMS ST., MUSKEGON, MICHIGAN

For more data circle 565 on Reader Service Card

316 modern machine shop

feed effected through a micrometer stop to assure a release accuracy of 0.0004 inch. There is claimed to be no recoiling of the carriage when the feed is released, minimizing tool breaks.

For more data circle 133 on Reader Service Card

★ ★ ★

AUTOMATIC PRESS FEED HANDLES STOCK WIDTHS OF 3 INCHES

The Producto Machine Co., 910 Housatonic Ave., Bridgeport 1, Conn., has introduced an automatic "Sure-feed" which is designed to handle maximum stock widths of 3 inches. All wearing parts of the hitch feed are made of hardened and ground tool steel to ensure long, trouble-free performance. The adjustable feed gripper plates can be reversed to give long life. According to the manufacturer, the feed unit can be mounted right on the die set so that the two units can be handled as one, and no press or feed alterations are required when mounting in any ordinary press.

Only two drive plates and simple linkage, controlled by the movement of the press, are used to advance the stock. The direct feeding action of the unit is said to make possible a relatively high degree of accuracy; however, pilots and other positioning means should be used where exact register of stock is required. The 3-inch feed unit is designed to handle stock thicknesses

JIG BORING

and

Large Precision Machining

Done to your specifications

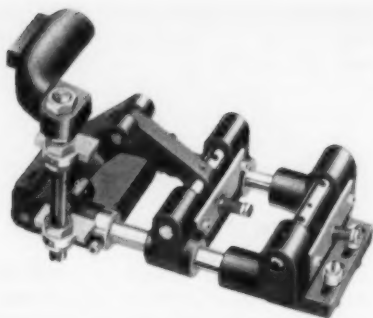
We Have 14 Jig Borers

KIDDE PRECISION TOOL CORP.

15 LOCUST AVENUE, ROSELAND, N. J.

For more data circle 566 on Reader Service Card

June, 1955



Producto 3-Inch Automatic "Surefeed" Unit

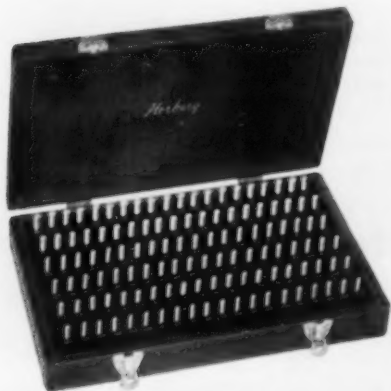
of from 0.005 to 0.055 inch. Feed length for presses having 1-inch stroke is 0.000 to $\frac{7}{8}$ inch, and feed length for presses having $1\frac{1}{2}$ -inch or more stroke is 0.000 to 3 inches.

For more data circle 134 on Reader Service Card

★ ★ ★

CYLINDRICAL GAGE SERIES COVERS RANGE FROM 0.025 TO 0.504 INCH

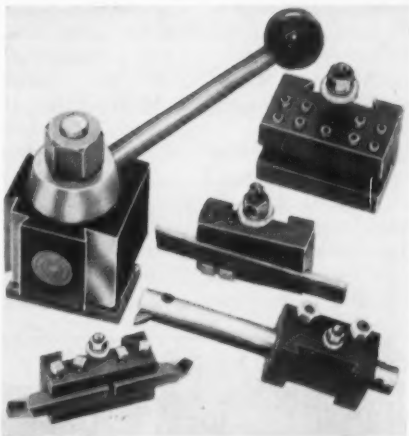
A series of cylindrical gages, covering the entire range of measurement



Horberg Cylindrical Gage Set in special case

June, 1955

GET THE MAXIMUM from your lathes by using the **ALORIS "Quick Change"** **TOOL POST**



Only a second to change tools for turning, facing, drilling, boring, reaming, cutting off or any other operation.

- GREAT REPETITIVE ACCURACY.
- RUGGED CONSTRUCTION.
- TESTED AND RECOMMENDED BY LEADING LATHE MANUFACTURERS.

Patented

Ask your dealer for a demonstration, or write for catalog today.

Some open territory still available for representatives.

See us at the Production Engineering Show, Sept. 6-16, Navy Pier, Chicago, Illinois.

MANUFACTURED BY
ALORIS TOOL CO., INC.
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FLUSHING 35, N. Y.

For more data circle 567 on Reader Service Card
modern machine shop 317

new shop equipment . . .

from 0.025 to 0.504 inch in steps of 0.001 inch, has been announced by Horberg Gage Co., 23 Staples St., Bridgeport, Conn. The series is conveniently grouped in four sets of 120 single gages each to provide ready accessibility and easy identification. The gages are straight cylinders, $1\frac{1}{2}$ inches long, formed of oil-hardened tool steel and fine-ground finished to a dimensional accuracy of plus 0.0001 and minus 0.000 inch. Roundness of the gages, it is claimed, has been held to within 0.000025 inch, and end squareness is within 0.0001 inch.

According to the manufacturer, the gage series provides extended measuring flexibility in production, inspection and quality control applications by affording incremental gaging steps over

a wide range of dimensions. Gage sets in the series are supplied in special fitted cases with protective felt-faced sponge rubber interiors and durable leatherette coverings.

For more data circle 135 on Reader Service Card

★ ★ ★

HAND TRUCK IS CUSTOM-BUILT

In line with the modern trend toward designing buildings, departments and equipment to fit streamlined materials handling operations, Leebaw Mfg. Co., 65 Wayne Ave., Youngstown, Ohio, has announced a hand truck which may be ordered custom-built. Several basic styles of trucks are offered, but each user can specify a particular truck built to his own special needs. Shown in the accompanying illustration is one of the most popular basic industrial models. It is an all-

MORE PARTS
PER HOUR
with

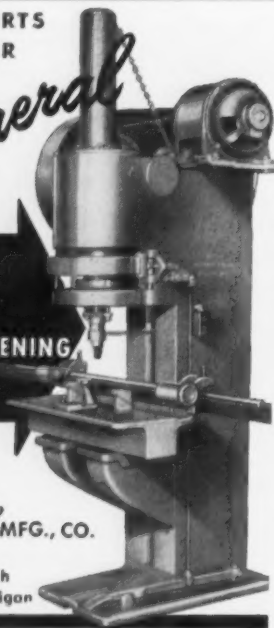
General

FLEXIBLE-
POWER
STRAIGHTENING
PRESSES

Let Us
Prove It!

General MFG., CO.

6433 Farnsworth
Detroit 11, Michigan



For more data circle 568 on Reader Service Card

318 modern machine shop

READING BENCH KEYSEATER

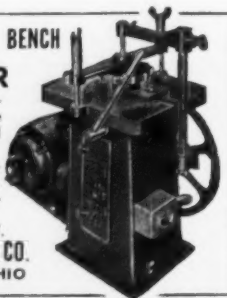
Portable—move directly to job; a time saver for both small and large shops.

$3\frac{1}{4}$ " stroke; adaptable for other work.

Low first cost—prompt delivery.

Good dealers wanted.

READING MACHINE CO.
CINCINNATI 37, OHIO



For more data circle 569 on Reader Service Card

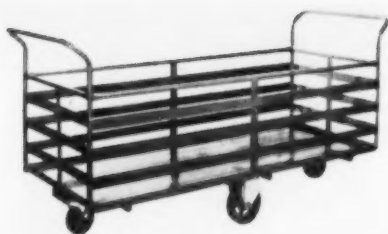
... for more than
1001 jobs



HJORTH LATHE & TOOL CO.
8 BEACON STREET WOBURN, MASS.

For more data circle 570 on Reader Service Card

June, 1955



Leebaw Custom-Built All-Steel Hand Truck

steel, welded utility truck which features 6-inch swivel-tilt type casters with mold-on rubber tires, making it easy to operate. Sturdy angle iron sides, steel pipe handles and a solid steel deck of the truck provide strength and durability for heavy-duty uses. The all-purpose truck, built to individual specifications, is said to be ideal for handling all types of merchandise. For more data circle 136 on Reader Service Card

★ ★ ★

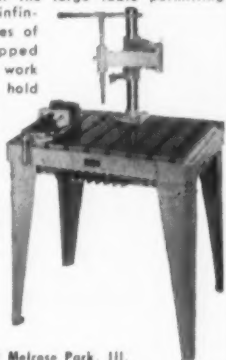
EIGHT-STATION INDEX MACHINE WELDS 720 PIECES PER HOUR

An eight-station index machine designed for a wide variety of spot, projection and arc welding production operations is available from Expert Welding Machine Co., 17144 Mt. Elliott Ave., Detroit 12, Mich. The machine, which is claimed to be capable of producing up to 720 welded assemblies per

hour, is of a simple, compact design that features an all-mechanical drive. Basically, the welder consists of a welded steel frame, a standard or special welding head, an electrical control cabinet, a 24-inch index table and a 1/2-h.p. motor-driven mechanical drive enclosed in the base of the machine. Manual loading, automatic index cycle and automatic part ejection are provided for the welder operation.

Are YOU Wasting Time? Gambling With Your Hand Tapping Job? Are Your Tapped Holes to Size and Square?

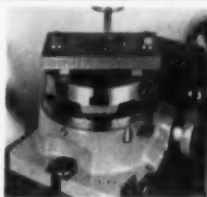
This Fixture will save you 60 per cent of your present free hand tapping time. The articulate arms swing clear of the large table permitting placing work. An infinite number and sizes of holes can be tapped without moving the work piece. Vise will hold work as small as 3/8" square. The tap floats and locates itself in the hole. Taps are held in individual spindles, requiring but a few seconds to change. Write for pamphlet.



TOOLS, Inc.

1733 No. 25th Ave. • Melrose Park, Ill.

For more data circle 571 on Reader Service Card



Model VT—Vertical

Another WALTER PRECISION DIVIDING HEAD

- High, Long-lasting Precision.
- Horizontal Operation.
- Quick Indexing and Degree Indexing.
- 6 and 3 Minute Readings with Vernier.
- Easy Operation.
- Versatility Increased by Various Accessories.

Also Universal, Semi-Universal and simpler models and PRECISION ROTARY TABLES in various sizes and executions.

Each tool supplied with a test report. Max. Permiss. Error Chart supplied with literature.

Sole Agents: KARL A. NEISE, 404 Fourth Ave., New York 16, N. Y., Dept. MMS

For more data circle 572 on Reader Service Card

new shop equipment . . .

The index table, which is mounted on tapered roller bearings, is driven by a simplified motorized cylindrical cam arrangement. The cam has a single groove that successively engages pins corresponding to the number of index

Rowbottom for Cams

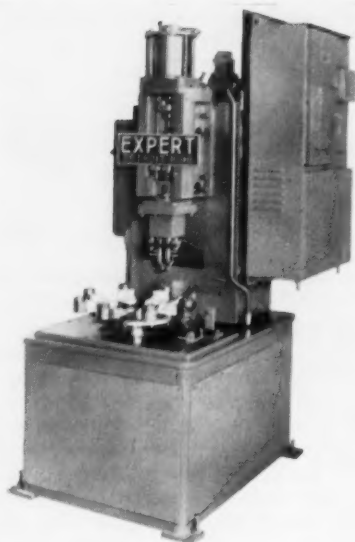


CAMS You specify . . .
we'll produce
Any quantity . . . quickly

Our half-century's highly specialized experience is assurance your needs will be promptly met . . . at worthwhile savings. Accuracy guaranteed. Submit samples or drawings for estimates.

THE ROWBOTTOM MACHINE CO.
WATERBURY • CONNECTICUT
Also builders of Cam Milling and Cam Grinding Machines. Details on request.

For more data circle 573 on Reader Service Card



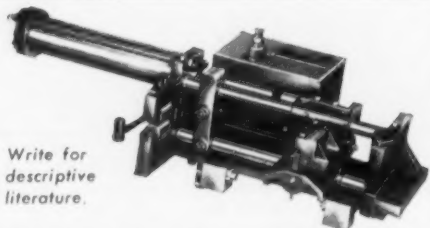
Expert Eight-Station Index Welding Machine

positions. Exceptionally smooth trapezoidal acceleration characteristics are said to be provided in the cam. One second indexes, it is claimed, are possible with this table drive. A flexible fixture mounting design on the machines assures that no loads imposed by gun operation are transferred to the index table. When long dwells are required, a clutch and brake unit is added to the motor drive.

According to the manufacturer, the

COOPER WEYMOUTH
OPEN THROAT
AIR OPERATED SLIDE FEED

Operates on standard shop air lines. Easy to set up and adjust, holds to extreme accuracy. Made in five sizes. Feeds lengths to 36", up to 18" wide on mechanical and hydraulic presses.



Write for
descriptive
literature.

COOPER WEYMOUTH, INC., 277 Noble Ave., Bridgeport 8, Conn.

For more data circle 574 on Reader Service Card

machine can be adapted for a variety of welding operations requiring six indexes and up by changing the cam and follower plate.

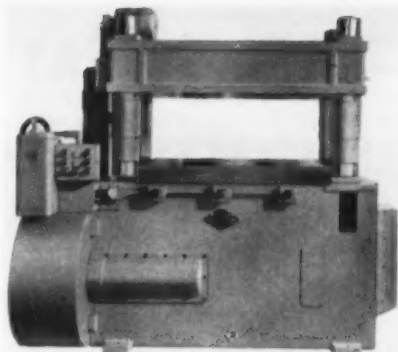
For more data circle 137 on Reader Service Card

★ ★ ★

100-TON PRODUCTION PRESS IS ONLY 7 FEET HIGH

A 100-ton production press which is only 7 feet high and which occupies 75 x 84 inches of floor space has been announced by Alpha Press and Machine, Inc., 9281 Freeland Ave., Detroit 28, Michigan.

The press is equipped with a four-speed operating control mechanism permitting a choice of 40, 50, 60 or 80 strokes per minute. According to the manufacturer, the area of the bed and clearance is unusually large in relation to the tonnage. There is said to



Alpha 100-Ton 7-Foot-High Production Press

be complete clearance between the posts from front to back and right to left.

The drive mechanism is housed in the base and pulls the head down, eliminating overhead thrust and assur-

★ ★ ★ ★ ★

MULTIPLE DRILLING with a . . .



➔ MULTI-DRILL

**Increases Capacity Up to 800%
ADJUSTABLE TO ANY HOLE PATTERN
. . . FITS ANY DRILL PRESS**

If your production requires drilling from 2 to 8 holes in a work piece, a MULTI-DRILL will cut costs and speed output up to 800%. The MULTI-DRILL is universally adjustable to any hole pattern—is compactly built to permit easy, unhampered operation with drill jigs or other special fixtures. Ruggedly built to take the wear and tear of high production work, the MULTI-DRILL will handle your long and short run multiple drilling jobs with ease and economy. The MULTI-DRILL will drill on hole centers as close as $\frac{1}{8}$ "—handle drill sizes up to $\frac{3}{8}$ " in steel. Special adaptations available.

There is a Commander MULTI-DRILL Distributor in your area. Write for his name, literature and complete details.

COMMANDER MFG. CO.

4224 WEST KINZIE ST.

CHICAGO 24, ILL.

Product of Commander — Builder of Production Tools

For more data circle 575 on Reader Service Card

new shop equipment . . .

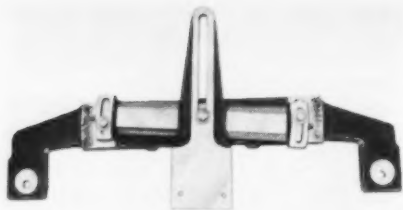
ing perfect alignment by both the punch and the die. The press has a forced feed lubricating system, herring-bone back gear and an air clutch. Two hand-operated safety push-button controls and one emergency stop button make the machine safe to operate.

For more data circle 138 on Reader Service Card

★ ★ ★

**TAPER ATTACHMENT
ACCURATELY FITS ALL
TYPES OF LATHES**

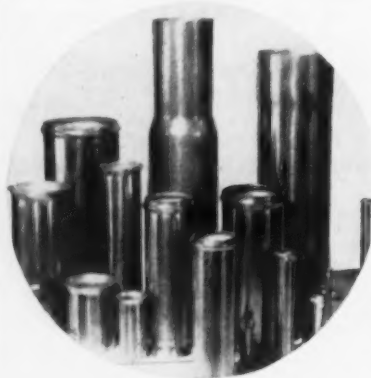
A heavy-duty taper attachment which is said to require only single over arm connection to the lathe cross slide, with no other holes to drill, has been announced by Master-Taper Co., 4531 N. Beacon St., Chicago 40, Ill.



Master-Taper Heavy-Duty Taper Attachment

The attachment incorporates dovetailing slides or ways to assure a high degree of accuracy and a simplified method of clamping to any lathe to allow setup in minutes. Only two dimensions need be given for factory fitting; namely, (1) the length of the carriage and (2) the distance across the top of the 45-degree V-way of the lathe to be fitted. The shipping weight of the heavy-duty attachment is about 80 pounds.

For more data circle 139 on Reader Service Card



**YOU CAN MEET EVERY
TUBE-END FORMING NEED
WITH
VAILL EQUIPMENT**

Designers, Equipment Engineers and Production Men are finding it to their advantage . . . in terms of better products at lower cost . . . to use formed-end tubes in their products wherever possible. And they are finding VAILL machines the economical equipment to use to cut costs and speed such operations as: beading, flaring, expanding, reducing, sinking, swaging, grooving, double-lap flaring and flanging.

VAILL offers a complete line of air-, hydraulic- and mechanical operated machines to shape and form ends of $\frac{1}{8}$ " to $4\frac{1}{2}$ " diameter tubes.

Write for General Bulletin G-3.



THE VAILL ENGINEERING COMPANY

133 E. Main St.

•

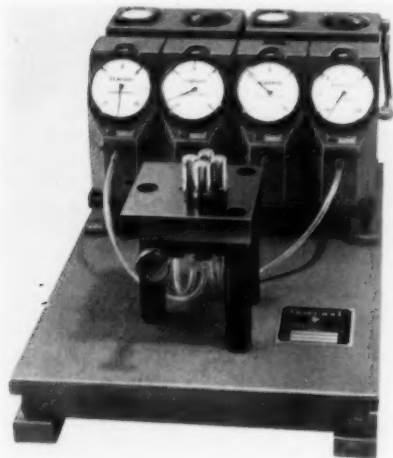
Waterbury 20, Conn.

For more data circle 576 on Reader Service Card

SIMULTANEOUS GAGING PERFORMED BY AIR GAGE

Designated as the Model A-167 B-1, a multi-Dimensionair air gage employing simultaneous gaging for a series of holes has been introduced by Federal Products Corp., 5144 Eddy St., Providence 1, R. I. The gage is designed to inspect four holes in a nozzle plate simultaneously. The inspection consists of measuring the diameter of each hole and checking them for roundness. The piece is placed on the platen so that an air plug fits into each hole.

First, the four Dimensionair dials are read to determine the hole diameters. If they are all correct, a push rod, which is connected to all four plugs with a gear train to rotate the plugs, is pushed in and out to make the roundness check. The dials are read from left to right as each hole is checked. This system eliminates the necessity of rotating the part itself. The push rod is only moved in one direction to turn the plugs 180 degrees; that is, it is pulled out to do the roundness check



Federal A-167 B-1 Multi-Dimensionair Gage

TAYLOR



Balancing Machines



with

"Speed Button" Control!

Just press the button . . . and read amount and location of out-of-balance immediately on the HI-MAX spirit level! "Speed Button" reduces operator fatigue, increases work output. Handles pieces up to 60" in diameter. Ideal for FANS • FLYWHEELS • IMPELLERS • GRINDING WHEELS • COUPLINGS • SHEAVES • PUMPS • CLUTCHES • BRAKE DRUMS • MANY OTHERS. Write for Bulletin 2925B.

TAYLOR DYNAMOMETER AND MACHINE COMPANY

DYNAMOMETERS • BALANCING MACHINES
DRILLING MACHINES

6411 River Parkway, Dept. MM, Milwaukee 13, Wisconsin
INTERNATIONAL DIVISION—DUMMANN WORLD
TRADE CO., Milwaukee 6, Wisconsin, U.S.A.

For more data circle 577 on Reader Service Card

modern machine shop 323

new shop equipment . . .

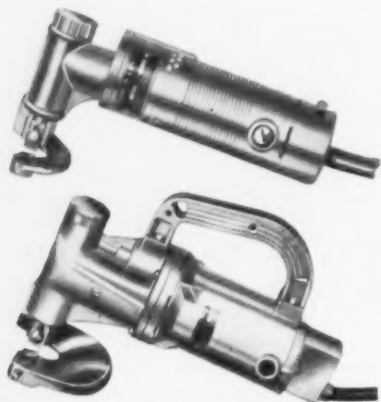
for one hole and pushed in for the next. This action is said to speed up the inspection considerably and is much simpler for gaging multiple holes than individual air plugs would be. According to the manufacturer any similar piece can be checked on this type of Dimensionaire gage, which provides the high magnification, speed and stable accuracy necessary for swift inspection of the most critical dimensions.

For more data circle 140 on Reader Service Card

★ ★ ★

ELECTRIC HAND SHEARS FOR HOT ROLLED SHEET STEEL

Jefferson Engineering & Mfg. Co., 269 Walker St., Detroit 7, Mich., has announced two electric hand shears, designated as the Model GES-6 and the Model GES-18. The Model GES-6 is designed for cutting 16-gauge (1/16 inch) hot rolled sheet steel. It provides a feed rate of from 15 to 20 feet per minute. The minimum radius which



(Top) Jemco GES-6 Electric Hand Shear and
(bottom) Jemco GES-18 Electric Hand Shear

can be cut with this unit is 1/2 inch (left hand) or 1 1/4 inch (right hand). The unit weighs 4 pounds.

The Model GES-18 is designed to cut 7-gauge (3/16 inch) hot rolled sheet steel at feeds of from 7 to 12 feet per minute. This tool weighs 27 pounds, but can be easily suspended when the particular job requires. The minimum radius which can be cut with this unit is 2 1/2 inches (left hand) or 3 1/2 inches (right hand). Both models are powered by a universal motor which operates on 115 or 230-volt, alternating or direct current.

For more data circle 141 on Reader Service Card

★ ★ ★

HIGH-SPEED AIRCRAFT EXTENSION AND THREADED SHANK DRILLS

Whitman & Barnes, 40050 Plymouth Rd., Plymouth, Mich., has announced a line of high-speed aircraft extension and threaded shank drills. The extension drills are designed for use where drilling operations, on aircraft bodies, cannot be reached with regular length drills. They are ordinarily made in 6 and 12-inch lengths. The shanks of the extension drills are spring tempered to prevent bending and breaking. All sizes have flute lengths the same as the equivalent sizes of jobbers', wire gauge and letter size drills.

The threaded shank drills are available in sizes ranging from 1/16 to 3/8 inch, No. 1 through No. 50 wire gauge and "A" through "W" letter sizes. Thread sizes are 5-40, 10-32 and 1/4-28. The drills are made in two lengths; namely, the short series and the long series.

Whenever ordinary drilling units cannot conveniently be used in close quarters and at difficult angles, it is advantageous to make use of angle drives and flexible shaft drives with screw

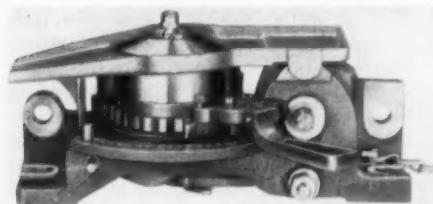
AIRCRAFT EXTENSION DRILLS
 WITH SPRING TEMPERED SHAFTS
 6 INCH OVERALL LENGTH



Illustration showing Whitman & Barnes High-Speed Extension and Threaded Shank Drills

adapters. Separate adapters are required for plain threaded shank drills. However, on the hex-type of shank, the adapter is an integral part of the drill.

For more data circle 142 on Reader Service Card



DEARBORN Automatic Chucking and Indexing Fixture

FEATURES:

1. Work held by collets
2. Automatic opening and closing
3. Work automatically ejected
4. Automatic indexing if required
5. Three models with capacities from 1/32" to 2".

J. W. DEARBORN
 ANSONIA • CONN.

Write for illustrated data. Send blue-prints or specifications of work.



For more data circle 578 on Reader Service Card

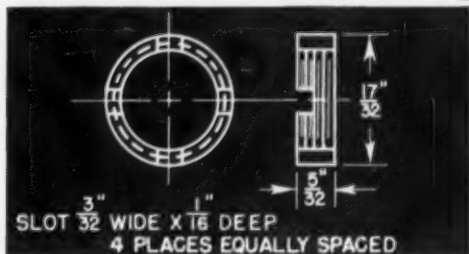
MACHINES BROACHES AND CENTERS END OF AUTOMOTIVE REAR AXLE

A broaching and centering machine which is designed to broach the end of an automotive rear axle to length and then center the broached surface has been announced by American Broach & Machine Co., Ann Arbor, Mich. The machine is arranged with four two-station fixtures equally spaced on an indexing trunnion which operates on an eight index arrangement. Two parts are unloaded and loaded by the operator at the front of the machine as the parts rotate past. In simultaneous operation, two parts are surface broached at the back station while two parts are center-drilled at the top station.

The operator pushes buttons after loading to start the cycle. The parts automatically clamp and index 45 degrees to an intermediate index station. This allows parts broached to swing clear at

1200 PIECES PER HOUR

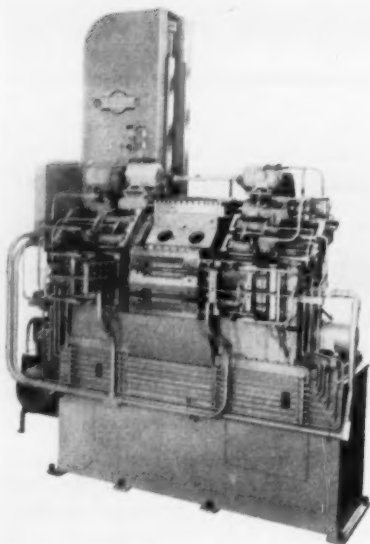
This piece was made from brass rod and slotted as shown in the print below. Production on this item was 1,200 pieces per hour.



new shop equipment . . .

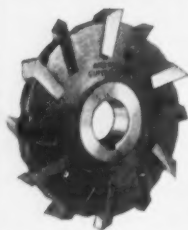
the back broaching station so the broach can be returned up to the starting position. Parts previously drilled at the top station also unclamp as they rotate down to an intermediate station. When the broach has returned to starting position, the trunnion indexes another 45 degrees to present two parts for broaching, two for drilling and two for unloading. The operator then reloads and repeats the cycle.

Tooling includes the fixtures which hold two parts each and locate and clamp with equalizing jaws at both ends. The clamping and unclamping is mechanical with a wedge-operated action, actuated by hydraulic cylinders mounted on supports on either side of the trunnion. The centering unit consists of two 2-spindle American units mounted on top of the trunnion sup-



American Broaching and Centering Machine

APEX CUTTING TOOLS



Super Cobalt, Stellite, or Carbide-Tipped.

FOR AIRCRAFT

Inserted-blade milling cutters stocked in over twenty types. Special types made promptly to order. Tapered, serrated blades adjustable to hold diameters. HSS, Steel,

Write for catalog.



APEX TOOL & CUTTER CO., INC.

Shelton 15, Connecticut

For more data circle 579 on Reader Service Card

port on either side of the fixture, and electrically interlocked to the cycle. Parts are broached by surface broaches, with the broach and holder assembly mounted on the vertical machine slide. The sectional broach assembly is of special design to allow $\frac{3}{4}$ -inch wear on the broaches. Broach height (from the holder) adjustment is obtained by taper wedge and interchangeable shims. The machine also has a motor driven chip conveyor unit designed for pit mounting, with the operator working at floor level.

For more data circle 143 on Reader Service Card

★ ★ ★

DUPLEX MILL FOR BOLT SEAT MILLING AND CAP SPLITTING OF CONNECTING RODS

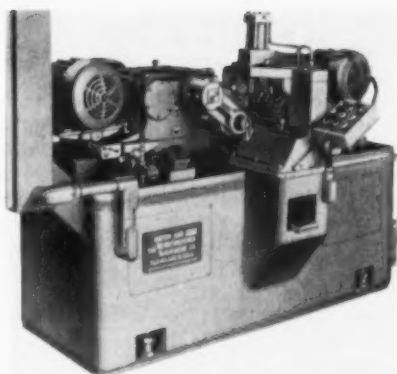
The Motch & Merryweather Machinery Co., 888 E. 70th St., Cleveland 3, Ohio, has announced a duplex mill

which is designed for bolt seat milling and cap splitting of connecting rods. The machine cuts, by circular saw, the cap from the connecting rod at the crankshaft end. Simultaneously, the top and bottom bolt seats are finish milled.

The single arbor on each head has a Triple-Chip circular saw blade between straddle milling cutters, which makes simultaneous cutting and milling possible. The machine consists of right and left-hand Match & Merryweather B-7 1/2 traveling milling heads which are mounted on hardened and ground steel ways.

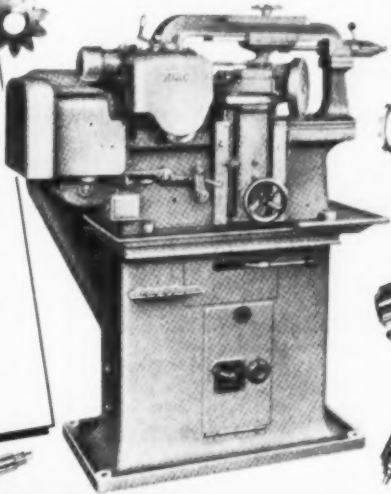
Each head has sturdy arbor supports for the saw blade and straddle milling cutters. The heads approach simultaneously, and the circle formed by the crank end of the connecting rod is cut in half and milled from two sides simultaneously.

The part is located in the fixture by placing the machined pin end of the



Match & Merryweather Duplex Mill for bolt seat milling and cap splitting operations

connecting rod over a hardened and ground pin with hardened steel blocks providing location at the crank end where the saw cut and straddle milling is performed. Clamping is accomplished by a hydraulic cylinder over



KOEPFER
GEAR
HOBBING MACHINE

A Universal Purpose Machine
for the economical production
in either small or large quantities of Spur Gears and Pinions, Spiral Gears, Worms as well as Worm Wheels.

WRITE FOR
ILLUSTRATED FOLDER

GEORGE SCHERR CO., Inc.

200-MM LAFAYETTE ST. • N. Y. 12, N. Y.

COMPLETE LINE OF
PRECISION INSTRUMENTS

For more data circle 580 on Reader Service Card

new shop equipment . . .

the top of the forging at the crank end. In removing the machined and split rod, the operator raises the shank end from the pin, pushing the cap into a chute for ejection at the front of the machine. The geared milling heads are each driven by 5-h.p. motors. The electrical and hydraulic system is built to J.I.C. standards.

For more data circle 144 on Reader Service Card

★ ★ ★

BAND SAW IS FULLY PORTABLE

Designated as the Model M, a portable band saw which is designed for users who require mobility of movement has been announced by Johnson Mfg. Co., 1011 Barnes St., Albion, Mich. Of all-steel construction, the saw is mounted on large 12-inch rubber-



Johnson Model M Portable Band Saw

tired wheels and can be moved easily by one man. The unit is comparatively light in weight and can be wheeled to any spot, in the event that it is more practical to roll the saw to the stock rather than bringing the stock to the saw. According to the manufacturer, the machine is capable of handling 5-inch rounds and 10-inch flats, thus eliminating hand cutting of structural steel, pipe, conduit, angle iron, reinforcing rods, and so on, while on the job.

For safety, locks are provided for the machine during transit. The front leg of the machine houses a storage compartment for extra saws. The machine measures 30 inches high and utilizes a blade measuring 7 feet 5 inches x 1/2 inch x 23 gauge. The unit is powered by a 1/3-h.p. motor and weighs 300 pounds.

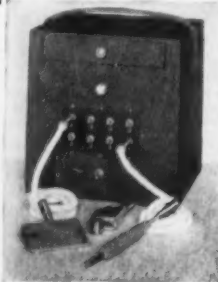
For more data circle 145 on Reader Service Card

★ ★ ★

PORTABLE INDUCTION HEATING UNIT FEATURES WATER RECIRCULATOR

Designated as the Model RRP, a compact and completely self-contained high frequency heating unit combining

**MARK
IRON,
STEEL
and
CARBIDES**



**THE
Etchograph
WAY**

Original Electric Etcher. Thousands in Daily Use Mark hardened parts, tools, dies, gages and fixtures of any ferrous metals including the hardest alloys and carbides — quickly — plainly. • Three sizes to meet all requirements.

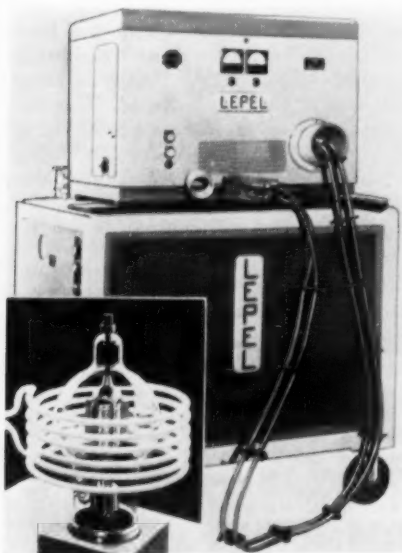
• Write for circulars and prices.

BREWSTER-SQUIRES CO.
P. O. Box 601 Englewood, N. J.

For more data circle 581 on Reader Service Card

an induction heating generator with a refrigerating water recirculator has been announced by Lepel High Frequency Laboratories, Inc., 55th St. & 37th Ave., Woodside, Long Island, N. Y. The unit, it is claimed, can be easily moved about the plant to any location where it may be needed. Once filled, there is no water consumption at all since the water in the unit is constantly refrigerated and recirculated, thus eliminating the need for water supply and drainage connections. The high frequency generator is designed to permit the use of long flexible leads between the unit and the work coil, which is said to be ideal in cases where the work to be done is at a distance from the generator.

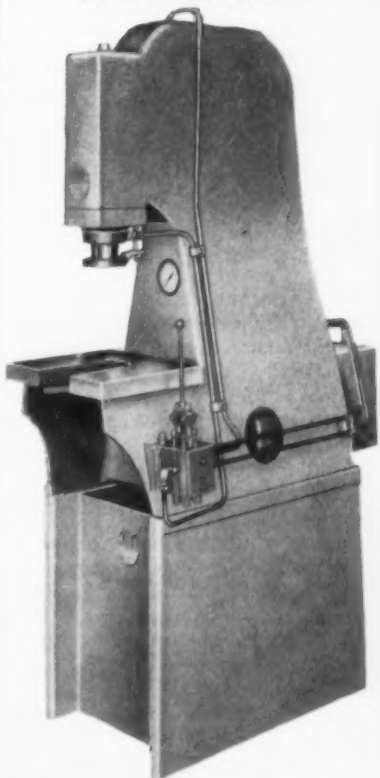
According to the manufacturer, the unit can also be used effectively for soldering, brazing and heat treating ferrous and non-ferrous metals. The induction heating unit operates on 110 or 220 volts, single phase current and



Lepel Model RRP Induction Heating Unit

June, 1955

NORTHERN



PROVEN POWER—HEAVY DUTY HYDRAULIC PRESSES AT VERY LOW COST

Tough jobs throughout industry are using these presses on production lines in a very wide capacity.

Shown is the Model GD which can be had in 10 or 20 ton capacity with strokes up to 24". Models AD or Arch-type frames can be had in 10-20 or 35 tons, also, with strokes up to 24". These presses are all double acting.

The GD presses can be had with open bolster plate as shown, where long shafts or objects can be slid under the ram.

Write for Literature

NORTHERN TOOL and MACHINE CO.
1549 North 31st Ave., Melrose Park, Illinois

For more data circle 582 on Reader Service Card
modern machine shop 329

new shop equipment . . .

contains a stepless Thyatron power control which permits selecting the proper power output easily.

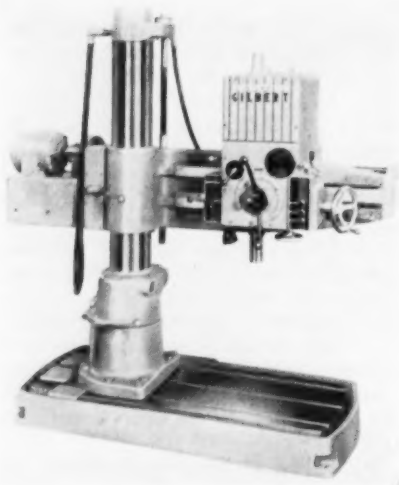
For more data circle 146 on Reader Service Card

★ ★ ★

RADIAL DRILL HAS HIGH SPINDLE SPEED RATIO

The Cincinnati Gilbert Machine Tool Co., 3366 Beekman St., Cincinnati 23, Ohio, has announced a 3-h.p. light-duty radial drilling machine which features a high spindle speed ratio. The machine offers three spindle speed ranges; namely, from 40 to 1,600 r.p.m., from 50 to 2,000 r.p.m. and from 80 to 3,200 r.p.m. Twelve geared spindle speed changes are provided in the head by means of sliding heat treated and hardened alloy steel gears mounted on ground integral multiple splined shafts. The machine is equipped with an automatic reverse to the spindle. The spindle and spindle sleeve are counter-balanced by an adjustable spring mechanism. The spindle nose has a Morse taper hole fitted with a renewable hardened tang slot.

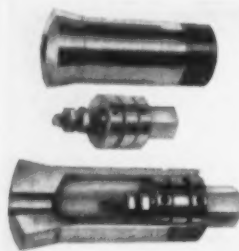
The head is mounted on the arm on two dovetail slides which require no adjustable gibs because the weight of the head is carried on adjustable ball



Gilbert Light-Duty Radial Drilling Machine

bearing rollers that operate on a hardened and ground way. The standard feed mechanism has four speeds—0.003, 0.007, 0.011 and 0.015 inch per revolution. Centralizing the lever clamps the arm securely to the column, making it impossible to raise or lower the arm while it is clamped. The arm movement stops automatically when it reaches either the top or the bottom of the column. It also stops automatically if any part of the head or arm should hit an obstruction when the arm is being lowered.

For more data circle 147 on Reader Service Card



COLLET STOPS (PATENT PENDING)

Used with collets for second operation work. Assuring consistent accuracy, permanent setup, producing identical results. No alterations to your collets are necessary. Fully adjustable. Available for any size collets, solid and spring ejector types. END GUESS WORK AND REJECTS.

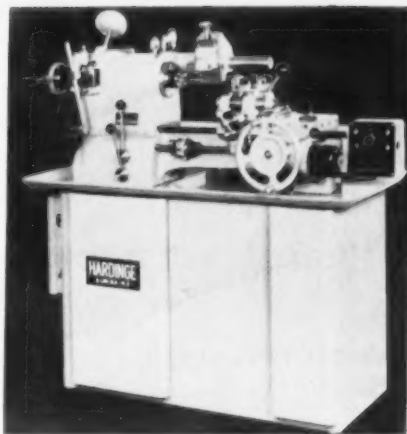
OTHER WOHLNIP PRODUCTS: Non-Rotating Drill Stops, Work Holder Clamps, Drill Extractors.

WOHLNIP PRODUCTS, INC. 634 CENTRAL AVENUE
EAST ORANGE, N. J.

For more data circle 583 on Reader Service Card

CHUCKING MACHINE FEATURES THREE-SELECTOR VARIABLE DRIVE

Hardinge Brothers, Inc., Elmira, N. Y., has announced a chucking machine, available in two models designated as the Models HCT and HC, which features a three-selector variable drive. According to the manufacturer, a three-position speed control lever at the headstock of the machine permits the operator to shift instantly from one speed to another without stopping the machine. Any three distinctly separate speeds within the 125 to 3,000 r.p.m. range of the machine may be preselected by easily adjusting master cams located conveniently just inside the motor compartment door. After preselecting the speeds, it is only necessary for the operator to move the top speed control lever at the headstock from one speed position to another and get instantly the desired preset speed.

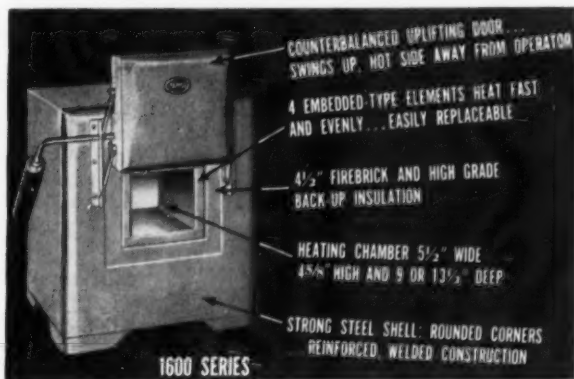


Hardinge Model HCT Chucking Machine

The Model HCT features a single-point production threading head. With one lead screw and follower, plus a

solve heat-treat problems

with versatile
Temco bench-
type furnace



Step up production, cut costs with Temco electric furnaces for heat treating dies, parts, tools, etc. Model illustrated above one of eight convenient sizes available with either electronic or manual temperature controls. Economical,



THERMO ELECTRIC MANUFACTURING CO.

• 488 HUFF ST., DUBUQUE, IOWA

For more data circle 584 on Reader Service Card

easy to install and operate, low cost. Priced from \$60.00 to \$569.00. Write for literature and nearest dealer's name.

new shop equipment . . .

$\frac{3}{8}$ -inch square tool bit, any diameter thread of the same pitch can be cut at high production speeds. The Model HC is available without the threading head for work which does not require threading operations.

For more data circle 148 on Reader Service Card

★ ★ ★

CARBIDE-TIPPED DRILL HAS HIGH-SPEED HARDENED STEEL BODY

Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich., has announced an improved carbide-tipped drill with a high-speed hardened steel body. The extra-large solid carbide end is said to afford maximum resistance to destruc-



Super Type HSC Carbide-Tipped Drill

tively high heats generated when cutting hardened steels. The drill is provided with a high-speed hardened steel body and shank which makes a strong tool with a long use life.

The drill is available in two types; namely, the Type HSC and the Type H. The Type HSC is available in 27 sizes, ranging from $\frac{3}{32}$ to $\frac{1}{2}$ inch, with a round shank. The Type H, with a hexagonal-shaped body, is provided in sizes from $\frac{3}{8}$ to $\frac{3}{4}$ inch. The drill can be supplied either in a compact plastic kit containing five of the most popular sizes or on split order.

For more data circle 149 on Reader Service Card

★ ★ ★

AT LAST!

A Low-Priced Dial Type Indicator
Has 2 contacts $\frac{1}{32}$ " threaded within $\frac{1}{8}$ ". Double Faced. Reads front and back. Two Crystals. Double faced dial indicator complete with plated holder including $\frac{1}{32}$ " and $\frac{1}{8}$ " contacts —

Black Penrate . . . \$8.95
No. 4 Superior Magnetic Base and Indicator Holder . . . \$8.95

Thousands of satisfied customers!

SUPERIOR INDICATOR CO.
P.O. Box 734, Rochester 3, N. Y.



Patented

For more data circle 585 on Reader Service Card

STACKING BIN IS DESIGNED FOR FAST, EASY HANDLING

Identified as the Style 900-D, a stacking bin which is designed for fast, easy handling of small parts has been announced by Bay Products, Inc., 3015 N. 16th St., Philadelphia 32, Pa. The unit features reinforced corners and a drop handle located in the back of the bin. It is spot welded in construction, with four rivets for added strength.

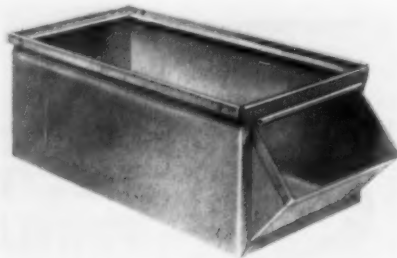
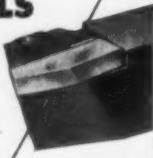
KENNAMETAL CUTTING TOOLS

for Increased Productivity

KENNAMETAL Inc.
LATROBE, PA.



**CEMENTED CARBIDE TOOLS,
BLANKS, MILLING CUTTERS**



Bay Style 900-D Stacking Bin for small parts

For more data circle 586 on Reader Service Card



CHARLES R. COX

Portrait by Fabian Bachrach

"I urge every executive..."

"I know of no better method for each citizen to protect the American way of life than by building his own economic security and by helping his Government to keep financially sound. Both these results can be accomplished through the Payroll Savings Plan. I urge every executive in the nation to give this Plan his active and vigorous support."

**CHARLES R. COX, President
Kennecott Copper Corporation**

With the active cooperation of Mr. Cox, Kennecott conducted a person-to-person canvass which put a Payroll Savings Application in the hands of *every* one of Kennecott's 20,000 employees. The men and women of Kennecott did the rest. Country-wide participation in Kennecott's Payroll Savings Plan rose from 24% to 52%.

Your State Director, U.S. Treasury Department, will be glad to help you install a Payroll Savings Plan. Write to Savings Bond Division, U.S. Treasury Department, Washington, D. C.

The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

MODERN MACHINE SHOP



new shop equipment . . .

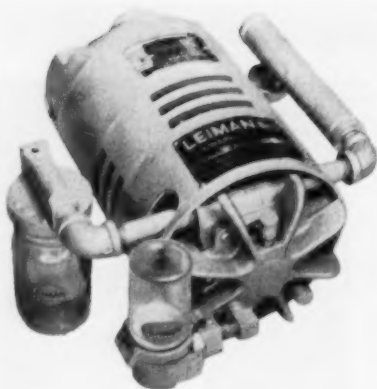
A continuous stacking rim on all four sides of the Style 900-D permits stacking with a Style 800-D box of the same length and width.

For more data circle 150 on Reader Service Card

★ ★ ★

INTEGRAL AIR PUMP AND MOTOR HAS LARGE CAPACITY

Identified as the Model K-3, a high-capacity integral air pump and motor unit, which is designed to provide 28 inches Hg. continuous vacuum and 20 pounds of pressure and which has a 7.2-c.f.m. displacement, has been announced by Leiman Bros., Inc., 149 Christie St., Newark 5, N. J. The overall size of the unit is 18½ inches long x 15 inches wide x 7 inches high.



Leiman No. K-3 Integral Air Pump and Motor

The unit features a ball bearing motor and rotary pump, with a cast iron housing and two steel blades equipped with automatic adjuster to ensure constant blade-to-wall contact. The unit is fan cooled and mounted on rubber silencers.

The unit's motor is furnished with automatic thermal overload protection. Utilizing a Leiman E-113 automatic lubricator, the unit is also equipped with an inlet filter and an outlet separator which is designed to provide oil-free air.

For more data circle 151 on Reader Service Card



Double End CYLINDRICAL PLUG GAGE with Handle

COMPLETE FOR \$7.50

24 HOUR DELIVERY

Gages are hardened, ground and lapped to your individual requirements.

Write for Folder

K. & K. GRINDING CO.

34 HERBERT ST. • BROOKLYN 22, N. Y.
EVERGREEN 7-4444

For more data circle 587 on Reader Service Card

GRIND THE *Eastern Centerless Way*

Our new plant with
increased facilities

assures

PROMPT SERVICE

Eastern Centerless Grinding Co.
470 Tolland Street East Hartford 8, Conn.

For more data circle 588 on Reader Service Card

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For more data circle 589 on Reader Service Card

where to get it

*Numbers shown are page
numbers in this issue*

A

Abrasives, Grain, Cloth, Paper, Disc,
etc., 42, 50, 51, 54, 64, 211
Air Operated Equipment (Look for
specific item)
Alloys, 281
Angles, 313
Arbors, 262
Assembling Machines, 257
Automated Equipment (Look for spe-
cific item)

B

Bags, Shipping, 223
Balancing Machines, 7, 23, 277, 323
Balancing Ways, 275
Balls, Tooling, 311
Bar Feeds, Pneumatic, 95
Bar Machines, Automatic, 84, 85
Bar Stock, 248
Bases, Machine, 186
Bases, Magnetic, 284
Bearings, Bronze, 261
Bearings, Motor, 261
Bearings, Thrust, 281
Belts, Drive, 197
Bending Devices, 154, 210, 238
Bending Machines, 77, 94, 154
Blades, Centerless Grinder, 248
Blades, Cutting-Off, 244
Blades, Shear, 32
Blocks, Magnetic, 93
Blocks, Step, 102
Blocks, V, 93, 313
Bolts, 102, 269
Boring, Drilling, Facing and Tapping
Machines, Combination, 173
Boring, Facing and Turning Machines,
169
Boring Heads, 68, 97, 277
Boring Mills, 10, 11, 70

Boxes, Stacking, 285, 307
Brakes, Press and Bending, 69, 86, 87,
92, 154, 240, 287
Brass Stock, 68b, 68c
Broaches, 214
Broaching Fixtures, 161
Broaching Machines, 28
Bronze Bars, 68b, 68c, 261
Brushes, Wire Wheel, 217
Buffers, Bench and Pedestal, 34, 295,
356
Buffing Machines, 34, 295, 356
Bushings, Brass, Bronze, etc., 261
Bushings, Carbide, 248
Bushings, Drill Jig, First Cover, 153,
202, 272, 297, 312
Bushings, Sleeve, First Cover

C

Cams, 254, 266, 285, 320
Carbides, 248
Centers, Bench, 202, 256
Centers, Index, 290
Centers, Lathe, Planer, Miller, etc.,
190, 262, 268, 288, 310, 337
Chairs, 176
Choppers, Scrap, 212
Chucking and Indexing Fixtures,
Combination, 325
Chucking Machines, Automatic, 84, 85
Chucking Units, Power, 303
Chucks, Air and Hydraulic, 27, 343
Chucks, Boring, 260
Chucks, Collet, 262, 343
Chucks, Drill, 68d
Chucks, Lathe, 68d
Chucks, Magnetic, 215, 254
Chucks, Power, 303
Chucks, Tap, 343
Clamps, 55, 102, 175, 219, 316, 330
Clutch Shafts, 296

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For more data circle 590 on Reader Service Card

where to get it . . . (Numbers shown are page numbers in this issue)

Clutches, Magnetic, 270
Coil Handling Equipment, 212, 293
Collets, 262, 312
Comparators, 33, 271, 355
Coolant Compounds, 45, 292
Coolants, 45, 71
Copper Metal, 68b, 68c
Counterbores, 38, 41, 63, 66, 83, 141
Countersinks, 66
Couplings, 277
Cut-Off Machines, 34, 289, 315
Cut-Off Wheels, 50, 51, 289
Cutter Sharpening Machines, 210
Cutters, Keyway, 273
Cutters, Milling, 41, 63, 71, 72, 141, 298, 326, 332
Cutting Oil Compounds, 45, 292
Cylinders, Hydraulic and Pneumatic, 27, 296

D

Die Cushions, Pneumatic, 69
Die Heads, 2, 84, 85, 151
Die Lifting and Handling Machines, 306
Die Making Machines, 24
Die Sets, 29, 67
Dies, Punching or Forming, 74, 76, 78, 191, 248, 267
Dies, Threading, 37, 41, 84, 85, 140
Dividing Heads, 168, 218, 283, 319
Dogs, Lathe, Grinder, and Miller, 190
Dressers, Grinding Wheel, 245
Dressing Fixtures, Grinding Wheel, 55, 206, 260, 281
Dressing Sticks, 82
Drifts, Drill, 262
Drill Extractors, 330
Drill Heads, 97, 167, 274, 279, 321
Drilling Attachments, 168
Drilling Machines, Automatic, 207
Drilling Machines, Bench, 235
Drilling Machines, Multiple Spindle, 90, 91
Drilling Machines, Radial, 49, 70, 90, 91, 148
Drilling Machines, Sensitive, 235
Drilling Machines, Turret, 62, 339
Drilling Machines, Unit Type, 12, 13
Drilling Machines, Upright, 90, 91, 148
Drilling Machines, Vertical, 34, 49, 222, 237, 323

Drilling, Tapping and Threading Machines, Combination, 147
Drilling Units, 12, 13, 207, 250
Drills, Center, Core, Twist, 38, 41, 63, 66, 141, 182, 244, 250, 262, 273, 279, 298, 312
Drills and Countersinks, Combination, 32
Drills, Portable Electric, 217
Drivers, Floating, 260
Drives, Gearshift, 213
Duplicating Machines, 241
Dust Control Equipment, 164, 242, 291, 356
Dynamometers, 79, 323

E

End Mills, 38, 41, 63, 71, 141, 182, 258, 298
Engraving Machines, 73
Envelopes, 281
Etchers, 328

F

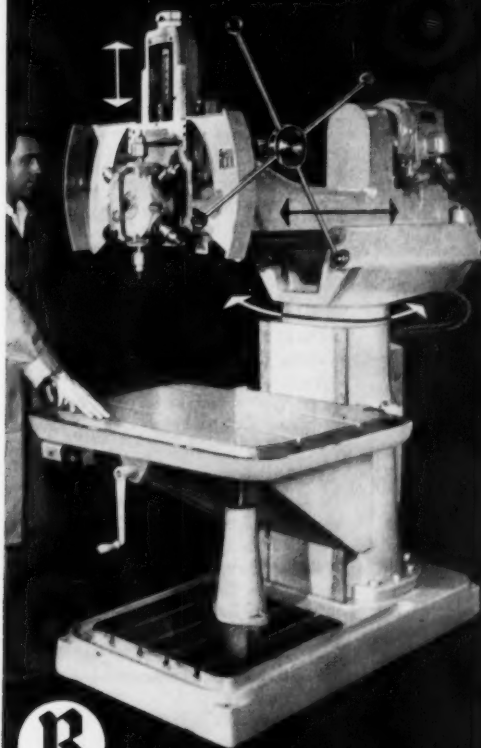
Feed Units, 257, 276, 320
Feeler Gage Stock, 264
Flexible Shaft Equipment, 167, 217, 225
Fluids, Cutting, 45
Forming Machines, 315, 322
Furnaces, Heat Treating, 98, 209, 331

G

Gage Blocks, 46, 79, 142, 143
Gages, 33, 37, 46, 68a, 79, 140, 142, 143, 155, 202, 224, 252, 302, 311, 334, 355
Gear Cutting Machines, 5, 210
Gear Measuring Instruments and Machines, 46
Gears and Gear Units, 5
Grinders, Abrasive Band and Belt, 271
Grinders, Air, 137, 196, 305
Grinders, Bench, 34, 295, 356
Grinders, Cam, 254, 320
Grinders, Center Type, 8, 9
Grinders, Centerless, 8, 9
Grinders, Cutter and Tool, 24, 237, 241, 341, 356
Grinders, Cylindrical, 42, 50, 51, 54
Grinders, Disc, 356

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For more data circle 591 on Reader Service Card

where to get it . . . (Numbers shown are page numbers in this issue)

Grinders, Drill, 24, 167, 356
Grinders, Face, 31
Grinders, Face Mill, 24
Grinders, Hand, 167
Grinders, Jig, 74, 76, 78, 90, 91
Grinders, Knife and Shear, 160
Grinders, Pedestal, 34, 237, 291, 295, 356
Grinders, Portable Electric, 167, 217
Grinders, Portable Pneumatic, 203
Grinders, Portable and Tool Post, 167, 356
Grinders, Saw, 160, 208
Grinders, Snagging, 356
Grinders, Surface, 39, 40, 101, 183, 187, 189
Grinders, Swing Frame, 282
Grinding Fluids, 45
Grinding Fixtures and Attachments, Third Cover
Grinding Heads, 74, 76, 78
Grinding Wheels, 42, 50, 51, 54, 57, 187, 197, 221, 251
Guards, Machine, 186
Guards, Punch Press, 285

H

Hammers, Lead, 288
Hand Tools, Power (Look for specific item)
Hardening Compounds, 252
Hardness Testing Devices, 79, 165, 266
Hinges, 289
Hobbing Machines, 231, 327
Hobs, 63, 141
Holders, Diamond, 93
Holders, Floating, 343
Holders, Indicator, 284
Holders, Magnetic Base, 284
Holders, Tap, 343, 351
Holders, Tool, 244, 291
Hones, 179
Honing Machines, 6
Hose, Air, 197
Hydraulic Equipment (Look for specific item)

I

Indicators, 68a, 79, 224, 332

J

Jacks, 102
Jig Bore, 3, 90, 91, 316
Jig Mills, 47
Jigs and Fixtures, 312
Joints, Expanding, 197

K

Keys, Machine, 283
Keys, Woodruff, 283, 304, 316
Keyway Cutting Machines, 318
Knees, Toolmakers', 313
Knives, 32
Knobs, Hand, 266

L

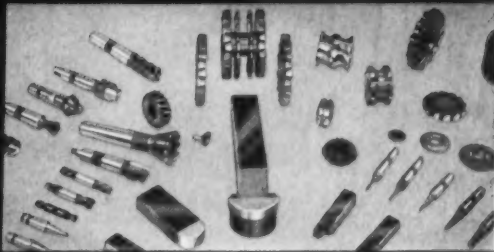
Lapping Machines, 8, 9
Lathes, Automatic, 7, 23
Lathes, Bench, 237
Lathes, Engine and Toolroom, 16, 17, 20, 21, 26, 36, 44, 60, 61, 229, 237, 265, 318
Lathes, Speed, 158
Lathes, Tracer, 20, 21
Lathes, Turret, 7, 23, 84, 85, 237
Layout Materials, 188, 254
Light Wave Measuring Equipment, 46
Lighting Equipment, 228, 283
Locks, Control, 56

M

Magnets, Lifting, 294
Magnifiers, 279
Mallets, Rawhide, 204
Mandrels, Expanding, 343
Mandrels, Lathe, 273
Marking Devices, 65, 172, 263, 269, 280
Matrixes, 281
Metallizing Equipment, 89
Micrometers, 46, 79
Microscopes, 267
Milling Fixtures, 53
Milling Heads, 80, 81, 97
Milling Machine Attachments, 68
Milling Machines, Cam, 254, 320
Milling Machines, Horizontal, 149, 241
Milling Machines, Universal, 241
Milling Machines, Vertical, 3, 49, 68, 239, 241

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For more data circle 592 on Reader Service Card

where to get it . . . (Numbers shown are page numbers in this issue)

Mills, Hollow, 300
Mills, Rolling, 315
Motors, 167
Mounted Wheels and Points, 50, 51

N

Nibblers, 306
Notching Machines, 154
Nuts, 75, 102

O

Oils, Cutting, 139, 177
Oils, Soluble, 71

P

Packings, 197
Pads, Toggle, 175
Pans, Lathe, Splash, etc., 186
Pans, Tote, 206
Pantographs, 88, 241
Parallels, 93, 313
Parters, Rod, 154
Parts, Machine Tool, Production, Aircraft, etc., 153, 202
Pinion Cutting Machines, 210
Pins, Dowel, Taper, etc., 202, 271, 273, 278, 283, 304
Pipe Plugs, 163
Plates, Angle, 304, 308, 313
Plates, Lapping, 313
Plates, Screw, 37
Plates, Sine, 282, 353
Plates, Surface, 313
Plungers, Spring, 175
Positioning Machines, Automatic, 90, 91
Power Units, Hydraulic and Pneumatic, 27, 153
Presses, Air, 27
Presses, Die Tryout, 246
Presses, Drawing, 92
Presses Hydraulic, 27, 69, 243, 287, 329
Presses, Power, 96, 191, 276
Presses, Punch, 69, 92, 162, 200, 236
Presses, Straightening, 318
Presses, Sub, 210
Presses, Turret Punch, 58, 59

Pulleys, 197
Pumps, Coolant and Lubricant, 27, 349
Punches, 191, 267
Punches, Bench, 216
Punching Machines, 154, 180
Pyrometers, 212

Q

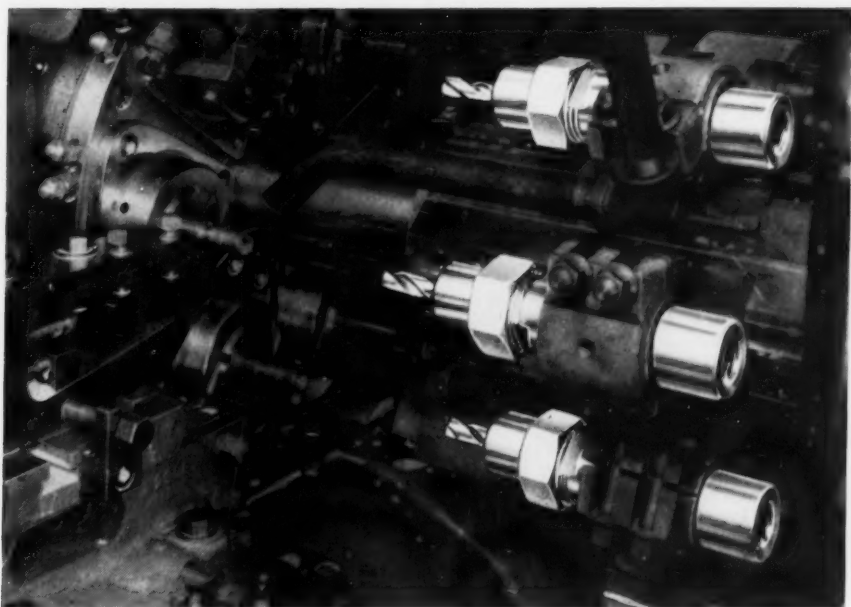
Quills, 171, 296

R

Racks, Machine, 283, 304
Reamers, 32, 38, 41, 63, 66, 141, 182, 228, 244, 273, 275, 314
Reels, 212
Refractories, 42, 50, 51, 54
Retaining Rings, 35
Riveting Machines, 259, 289, 312
Rollers, 154
Rolling Machines, 315
Rolls, 248
Rolls, Bending, 180
Roughness Comparison Specimens, 202
Rust Preventatives, 310

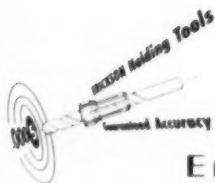
S

Sandblast Equipment, 174, 288
Sanders, Portable Electric, 217
Sanding Machines, Belt and Disc, 249
Saw Blades, Circular, 32, 49, 71
Saw Blades, Hack, 19
Saw Blades, Hole, 217
Saw Blades, Slitting, 32, 298
Saw Sharpening Machines, 49, 160, 208
Sawing Machines, Band, 276
Sawing Machines, Circular, 49
Sawing Machines, Friction, 180
Sawing Machines, Hack, 19
Saws, Portable Electric, 217
Screw Drivers, Portable Electric, 345
Screw Driving Machines, Power, 257
Screw Machines, Automatic, 241
Screws, Cap, Set, Socket, and Machine, 163, 181, 269, Fourth Cover



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For more data circle 593 on Reader Service Card

June, 1955

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where to get it . . . (Numbers shown are page numbers in this issue)

- Screws, Thumb, 175
 Screws, Transfer, 282, 290
 Services: Milling, Grinding, Lapping, Rebuilding, Repairing, Business, etc., 254, 266, 273, 285, 296, 316, 320, 334
 Shapers, 86, 87, 237
 Shearing Machines, 86, 87, 154
 Shearing, Punching, and Coping Machines, Combination, 180
 Shears, Bench, 154, 166
 Sheaves, 197
 Shim Stock, 264
 Shims, 264
 Sine Bar Fixtures, 55
 Sleeves, 262, 296
 Slotters, 166
 Slotting Machines, 18, 290
 Sockets, 262
 Solenoids, 84, 85
 Sorting Machines, 355
 Spacing Collars, 264
 Spacing Fixtures, 159
 Special Machinery, 7, 23, 49, 52, 74, 76, 78, 147, 173
 Speed Reducers, 308
 Spindles: Grinding, Boring, Milling, etc., 153, 286, 296
 Spring Coilers, 255
 Spring Winders, 154
 Staking Machines, 312
 Steadyrests, 260
 Steel, Die, 25, 205
 Steel, Tool, 201
 Stools, 176
 Stops, Collet, 330
 Stops, Drill, 330
 Stops, Spring, 175
 Straightedges, 313
 Straightening Machines, 285, 299
 Studs, 269
 Superfinishing Machines, 7, 23
 Swaging Machines, 22
 Switches, 84, 85
 Tapes, Adhesive, Recording, etc., 197
 Tapes, Pressure Sensitive, 42, 50, 51, 54
 Tappers, Hand, 319
 Tapping Attachments, 253
 Tapping Compounds, 45
 Tapping Heads, 222, 253, 274, 279, 351
 Tapping Machines, 222, 287
 Taps, 37, 41, 140, 182
 Thread Rollers, Automatic, 84, 85
 Threading Machines, 99, 210, 247
 Tool Bits, 48, 66, 182
 Tool Blanks, Second Cover, 332
 Tool Posts, 317
 Tooling, Block, 43
 Tooling, Plastic, 74, 76, 78
 Tools, Boring, 43, 83, 309
 Tools, Carbide, 66, 248, 309, 332
 Tools, Carbide-Tipped, 38, 141, 298
 Tools, Chamfering, 83
 Tools, Dressing, 245
 Tools, Facing, 83
 Tools, Form, 72
 Tools, Grooving, 35
 Tools, Honing, 179
 Tools, Special Cutting, 66, 72, 74, 76, 78, 83, 141
 Tools, Threading, 84, 85
 Transfer Processing Machines, Automatic, 49, 74, 76, 78
 Triangles, Shop, 46
 Trunnions, Indexing, 88
 Turrets, Lathe, Tool Post, Bed and Tailstock, 308
 Valves, 27
 Vise Jaws and Stops, 53
 Vises, Bench and Machine, 53, 55, 68, 212, 255, 267, 275, 290, 308, 312
 Welding Equipment and Supplies, 30, 178
 Wipers, Industrial, 14, 15
 Wire Straighteners, 299
 Wires, Measuring, 46
 Wrenches, 4
 Wrenches, Torque, 273

T
 Tables, Duplicator, 301
 Tables, Elevating, 233, 269, 335
 Tables, Rotary and Index, 74, 76, 78, 168, 222, 290, 308, 319

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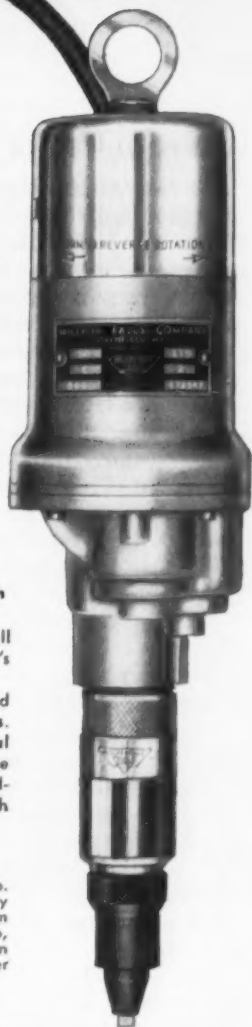
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the last word

By Fred W. Vogel, Editor

WORTH REPEATING

Mr. M. A. Hollengreen, the very able president of the National Machine Tool Builder's Association made some remarks at the Association meeting in Chicago last month which have disturbed us since we heard them. The remarks disturbed us because they prove that the story of the American economy is not a complicated difficult-to-understand story as many people have made it out to be. They have disturbed us because they do not confound or confuse. They have disturbed us because they prove that the story that must be repeated over and over and over again can really be told in simple terms . . . but rarely ever is.

In brief, here is what Mr. Hollengreen had to say:

"In America, we don't think that only a privileged few people are entitled to modern comforts and conveniences. We believe that practically everyone should have an automobile, and a washing machine, and a refrigerator, and a radio, and the dozens of other labor saving, comfort giving products of American industry. We understand that there is no limit to human desires—and if we can get the cost down low enough,

we will have mass markets that will build up great industries, because people *want* the things that these industries can produce.

"Now—How do we get cost down?

"We get costs down by automation, which is simply another word for mechanization.

"Now let's review the relationship between automation and employment. It's really very simple.

"As manufacturing costs go down, more people can buy a product.

"As more people buy the product, production goes up.

"As production goes up, the manufacturer can employ more people.

"As more people are employed, more people can buy the products of American industry.

"This is the cycle that has given our United States the highest standard of living the world's ever seen!"

★ ★ ★

MILLIONS TO SAVE BILLIONS

Like Generals in the field discussing strategy before the big push, members of the Machine Tool Show Committee last month in Chicago reviewed courses of action and all the ways and methods of assuring a completely victorious Show in September. It was obvious from all re-

ports that exhibitors are sparing neither expense nor effort to make their displays of metalworking equipment the finest and most complete of any ever shown.

Evidence that Machine Tool Builders are sparing no expense may be found in the report that an estimated 12 to 16 million dollars is being spent on a show which starts on September 6, and closes a short twelve days later. Can such an expense be justified? It can if those engaged in metalworking operations from the president of an organization down to the last person in the plant who has any authority to either buy or specify the purchase of new equipment make an effort to attend the Show.

And further, let us look at it this way. There are still in operation, in the metalworking plants of the United States, hundred of thousands of antiquated, obsolete, almost worn-out machine tools. These old ma-

chines represent high cost production, by comparison to the productivity per man hour that has been built into today's new models, largely by progressive development of automatic controls.

These old machines are a drag upon the nation's economy. They act as a brake upon the cycle of normal progress and growth. Everyone knows that sooner or later they must be replaced. Most of them should have been replaced long ago.

The machine tool industry has carefully calculated that it can guarantee the metalworking industry of the United States almost fantastic savings. If the metalworking industry will undertake immediately a sound and comprehensive program of replacement of obsolete machine tools, the savings effected will total over a billion dollars a year.

Where can this money-saving equipment best be seen? In Chicago, of course, September 6 through 16.



N.M.T.B.A. Machine Tool Show Committee: (back row) James C. Hebert, Jones & Lamson Machine Co.; Donald H. McIver, Ex-Cell-O Corp.; Frank Moran, The Carlton Machine Tool Co.; Stanley A. Brandenburg, The Monarch Machine Tool Co.; Burnell A. Gustafson,

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index to advertisements

*For listing of products offered by
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Where To Get It Section*

A

| | |
|-----------------------------------|--------------|
| Abrasive Machine Tool Co. | 31 |
| Abrasive Products, Inc. | 211 |
| Ace Drill Bushing Co. | 272 |
| Acme Industrial Co. | 202 |
| Acme Tool Co. | 313 |
| Adamas Carbide Corp. | Second Cover |
| Adjustable Clamp Co. | 316 |
| Agel Mfg. Co. | 242 |
| Albertson & Co., Inc. | 217 |
| Almond Mfg. Co., T. R. | 68d |
| Aloris Tool Co. | 317 |
| Alpha Press & Machine, Inc. | 246 |
| American Brass Co. | 68b, c |
| American Chain & Cable Co. | 165 |
| American Drill Bushing Co., Inc. | First Cover |
| American Hollow Boring Co. | 296 |
| American Positive Grip Vise Corp. | 275 |
| American Roller Die Co. | 315 |
| Ames Co., B. C. | 224 |
| Anderson Bros. Mfg. Co. | 275 |
| Anton Machine Wks. | 93 |
| Apex Tool & Cutter Co. | 326 |
| Armstrong-Blum Mfg. Co. | 19 |
| Armstrong Bros. Tool Co. | 102 |
| Auto Moulding & Mfg. Co. | 289 |

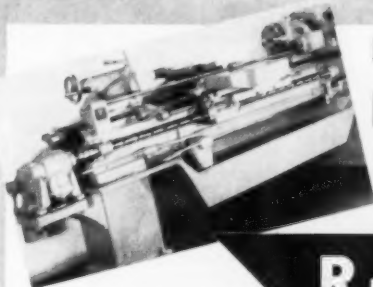
B

| | |
|-----------------------------|--------|
| Bald Eagle Tool Co. | 282 |
| Baldwin-Lima-Hamilton Corp. | 10, 11 |
| Barnes Drill Co. | 179 |
| Bay Products, Inc. | 285 |
| Bestly-Welles Corp. | 182 |
| Beverly Shear Mfg. Co. | 166 |
| Black Drill Co. | 250 |
| Blanchard Machine Co. | 187 |
| Boyar-Schultz Corp. | 39 |
| Brewster-Squires Co. | 328 |
| Bridgeport Machines, Inc. | 68 |

| | |
|----------------------------|-----|
| Brighton Screw & Mfg. Co. | 181 |
| Buckeye Tools Corp. | 203 |
| Buffalo Mchry. Co., Inc. | 277 |
| Bullard Co. | 169 |
| Bunting Brass & Bronze Co. | 261 |
| Burg Tool Mfg. Co. | 339 |
| Butterfield Div. | 41 |

C

| | |
|---|--------|
| Card Mfg. Co., S. W. | 37 |
| Carroll Dividing Head Co. | 283 |
| Cerro de Pasco Corp. | 281 |
| Chicago Rawhide Mfg. Co. | 204 |
| Cincinnati Bickford Tool Co. | 148 |
| Cincinnati Electrical Tool Co. | 34 |
| Cincinnati Gilbert Machine Tool Co. | 70 |
| Cincinnati Milling Machine Co. | 8, 9 |
| Cincinnati Milling Machine Co., Cincinnati Milling Products Div. | 45, 57 |
| Cincinnati Shaper Co. | 86, 87 |
| Circular Tool Co. | 32 |
| Cleveland Crane & Engr. Co. | 92 |
| Cleveland Punch & Shear Wks. Co. | 191 |
| Collis Co. | 262 |
| Commander Mfg. Co. | 321 |
| Commercial Centerless Grinding Co. | 273 |
| Comtor Co. | 302 |
| Cannors & Davis Sales Corp. | 255 |
| Continental Machine Co. | 289 |
| Continental Tool Wks., Division of Ex-Cell-O Corp. | 72 |
| Cook, Inc., L. H. | 288 |
| Cooley Electric Mfg. Corp. | 98 |
| Cooper Weymouth, Inc. | 320 |
| Coulter Machine Co., James | 99 |
| Covel Mfg. Co. | 40 |
| Crestline Products, Inc. | 277 |
| Cross Co. | 52, 56 |
| Crossley Machine & Tool Co., Inc. | 212 |
| Crucible Steel Co. of America | 201 |



**DOES
EVERYTHING
WELL**

*Illustrated is a
Sidney Model 16
lathe equipped
with a Gusher
Coolant Pump*

Ruthman GUSHER coolant pumps

Check these features that give your
Gusher Pump —

Better Performance — Split second
copious coolant flow with no priming
necessary.

Longer Life — Electronically balanced
rotating shaft to minimize wear and
vibration.

Less Maintenance Cost — No packing
necessary with Gusher Pumps, elimi-
nating resultant friction.

Always specify Ruthman Gusher Coolant
Pumps on your metal cutting machinery.



THE RUTHMAN MACHINERY CO



1817 READING ROAD

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CINCINNATI 2, OHIO

For more data circle 595 on Reader Service Card

index to advertisements . . . (For listings of products consult Where To Get It Section)

D

| | |
|---|---------|
| Danly Machine Specialties, Inc. | 29 |
| Davis Boring Tool Div., Giddings & Lewis Machine Co. | 43 |
| Dearborn Co., J. W. | 325 |
| Desmond-Stephan Mfg. Co. | 245 |
| Detroit Power Screwdriver Co. | 257 |
| Detroit Stamping Co. | 264 |
| DeVlieg Machine Co. | 47 |
| Donovan Mfg. Co. | 267 |
| Dreis & Krump Mfg. Co. | 240 |
| duMont Corp. | 48, 214 |
| Dumore Precision Tools | 167 |
| Durant Tool Supply Co. | 285 |
| Dykem Co. | 188 |

E

| | |
|---|---------|
| Eastern Centerless Grinding Co. | 334 |
| Economy Engr. Co. | 335 |
| Edroy Products Co. | 279 |
| Eisler Engr. Co., Inc. | 285 |
| Enco Mfg. Co. | 284 |
| Engineering & Research | 259 |
| Erickson Tool Co. | 343 |
| Ex-Cell-O Corp. | 72, 153 |
| Excelsior Tool & Machine Co. | 287 |

F

| | |
|---|--------|
| Fairfield Gauge Co., Inc. | 252 |
| Farrel-Birmingham Co., Inc. | 5 |
| Federal Press Co. | 200 |
| Federal Products Corp. | 68a |
| Field & Son, Inc., W. W. | 53 |
| Foote-Burt Co. | 28 |
| Fosdick Machine Tool Co. | 90, 91 |
| Franklin Balmar Corp., N. A. Strand Div. | 225 |
| Fulmer Co., C. Allen | 6 |

G

| | |
|--------------------------------------|-------|
| Gallmeyer & Livingston Co. | 101 |
| Gammons-Haaglund Co. | 314 |
| General Mfg. Co. | 318 |
| Gillen Co., John | 278 |
| Gisholt Machine Co. | 7, 23 |
| Gorton Machine Co., George | 241 |
| Govro-Nelson Co. | 207 |
| Grant Mfg. & Machine Co. | 289 |
| Greaves Machine Tool Co. | 149 |

| | |
|----------------------------------|-----|
| Greenerd Arbor Presses | 287 |
| Greenlee Tool Co. | 238 |
| Gwilliam Co. | 281 |

H

| | |
|---|---------------|
| Halpern & Co., Inc., Wm. | 293 |
| Hamilton Tool Co. | 231, 233, 235 |
| Hammond Mchry. Builders, Inc. | 271, 291 |
| Hanchett Magna-Lock Corp. | 215 |
| Hanchett Mfg. Co. | 160 |
| Hartford Special Mchry. Co. | 159 |
| Hartmann Mfg. Co. | 308 |
| Haskins Co., R. G. | 196 |
| Hauser Mfg. Co. | 306 |
| Hayden Twist Drill Co. | 279 |
| Heimann Mfg. Co. | 290 |
| Heller Machine Co. | 49 |
| Hersen Chemical Co. | 292 |
| High Speed Hammer Co. | 312 |
| Himoff Machine Co., Inc. | 254 |
| Hisey-Wolf Machine Co. | 356 |
| Hjorth Lathe & Tool Co. | 318 |
| Hoggson & Pettis Mfg. Co. | 172 |
| Holo-Krome Screw Corp. | Fourth Cover |
| Houston Grinding & Mfg. Co., Inc. | 268 |
| Howe & Fant, Inc. | 62 |

I

| | |
|--------------------------------|-----|
| Ideal Industries, Inc. | 337 |
|--------------------------------|-----|

J

| | |
|------------------------------------|-----|
| J & S Tool Co., Inc. | 55 |
| Jaco Devices, Inc. | 212 |
| Jiffy Mfg. Co. | 223 |
| Johansson Gage Co., C. E. | 79 |
| Johnson & Bassett, Inc. | 88 |
| Jones & Lamson Machine Co. | 151 |

K

| | |
|------------------------------------|----------|
| K & K Grinding Co. | 334 |
| Kalins & Co., J. M. | 301 |
| Kasnit Co. | 252 |
| Kaufman Mfg. Co. | 287 |
| Kearney & Trecker Corp. | 80, 81 |
| Kennametal, Inc. | 332 |
| Keo Cutters | 273 |
| Kidde Precision Tool Corp. | 266, 316 |
| King, Andrew | 266 |
| Klaas Machine & Mfg. Co. | 236 |

an amazing new Tapper!

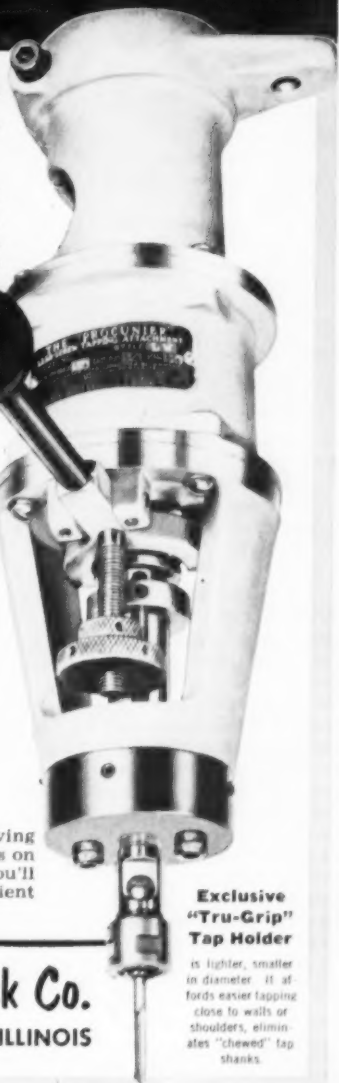
Never Before Such Tapping Accuracy, Such Precision, Such Quality . . .

You'll be hearing a lot about this great new **LEAD SCREW** tapping unit with the "finger-tip" driving action. It's an exclusive Proconier engineering triumph that is astonishing users everywhere with its fool-proof performance. Has built in features and mechanical advancements unlike anything you have ever seen. Think of it! . . . you can now produce gauge perfect parts—always! There's no variation—ever, in the tapping action, no parts spoilage, no thread distortion and because the driving action is so gentle, operator fatigue is eliminated! This outstanding unit defies comparison—see why:

- finger tip trigger arm travels only $\frac{3}{8}$ " on up or down stroke.
- tap idles in neutral, reverses at twice forward speed.
- friction clutch helps prevent tap breakage and disengages should tap strike obstruction or bottom.
- positive depth stop holds uniform depth to within .005".
- has famed Proconier cork faced friction clutch.
- consistently produces gauge fits in any pitch from 20 to 80!
- hardened and ground lead screw assembly replaced in seconds for varying pitches.
- tap capacity 0" to $\frac{1}{4}$ " in soft material—0" to $\frac{3}{16}$ " in steel.
- unique wiper oils and cleans lead screw while in operation.
- lead screw travel 1- $\frac{3}{16}$ ". Will easily hold class 3 fit.
- can be air operated.



Send for **FREE brochure** giving full details, specifications and prices on this new lead screw tapping unit. You'll quickly see why it is the most efficient tapping head made—bar none!



Exclusive "Tru-Grip" Tap Holder

is lighter, smaller in diameter. It affords easier tapping close to walls or shoulders, eliminates "chewed" tap shanks.

Proconier Safety Chuck Co.

12 S. CLINTON ST. • CHICAGO 6, ILLINOIS

For more data circle 596 on Reader Service Card

index to advertisements . . (For listings of products consult Where To Get It Section)

Kling Bros. Engr. Wks. 180
Knight Mchry. Co., W. B. 3

L

L-W Chuck Co. 254
Landis Machine Co. 2
Lapeer Mfg. Co. 219
Last Word Sales Co. 260
Latrobe Steel Co. 205
LeBlond Machine Tool Co., R. K. 20, 21
Lees-Bradner Co. 247
Leiman Bros., Inc. 174
Lempco Industrials, Inc. 189
Lewthwaite Machine Co., T. H. 267
Lima Electric Motor Co. 213
Lincoln Electric Co. 30
Lindberg Engr. Co. 209
Lindberg Products Co. 288
Linley Bros. Co. 291
Lipe-Rollway Corp. 95
Littleford Bros., Inc. 186
Lodge & Shipley Co. 26
Logan Engr. Co. 36
Logansport Machine Co., Inc. 27
Lucas & Son, Inc., J. L. 206
Luers, J. Milton 244

M

Madison-Kipp Corp. 305
Manhattan Supply Co. 275
Martin Machine Co., J. E. 312
Mattison Machine Wks. 183
McCrosky Tool Corp. 83
Metal Carbides Corp. 248
Metallizing Engr. Co., Inc. 89
Mettler Machine Tool, Inc. 299
Michigan Drill Head Co. 222
Michigan Chrome & Chemical Co. 254
Micro Drill Guide 312
Mid-West Abrasive Co. 251
Millers Falls Co. 345
Monarch Machine Tool Co. 16, 17
Morris Machine Tool Co. 12, 13
Mott & Merryweather Mchry. Co. 71
Mummert-Dixon Co. 282

N

National Acme Co. 84, 85
National Automatic Tool Co., Inc. 173
National Broach & Machine Co. 161

National Twist Drill & Tool Co. 141
Nebel Machine Tool Co. 44
Neise, Karl A. 277, 319
Nelco Tool Co., Inc. 298
New Albany Machine Mfg. Co. 162
New Hermes, Inc. 73
New Method Steel Stamps, Inc. 280
Nichols-Morris Corp. 218
Nielsen, Inc. 310
Nielsen Tool & Die Co. 282
Nirof Mfg. Co. 288
Noble & Westbrook Mfg. Co. 65
Northern Tool & Machine Co. 329
Norton Co. 42, 50, 51, 54, 82
Numberall Stamp & Tool Co. 269
Nu-Tangs, Inc. 285

O

Oliver Instrument Co. 24
Olson Industrial Products Co. 308
O'Neil-Irwin Mfg. Co. 154
Ottmiller Co., Wm. H. 269

P

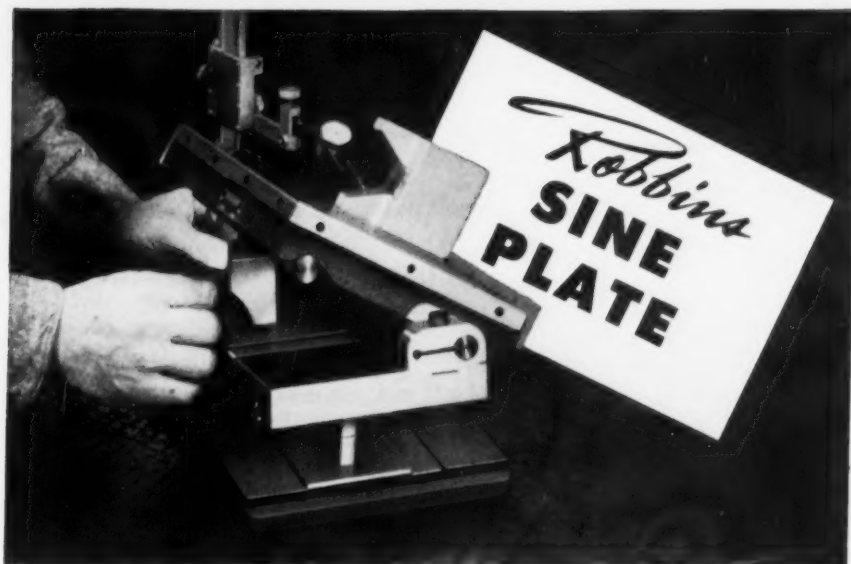
Parker-Kalon Div. 163
Peaslee Metal Products Co. 271
Pedrick Tool & Machine Co. 77
Perkin-Elmer Corp. 267
Pines Engr. Co., Inc. 94
Pratt & Whitney 33, 341
Precise Products Corp. 171
Procurier Safety Chuck Co. 351
Production Specialties, Inc. 310
Producto Machine Co. 67
Pyrometer Instrument Co. 212

Q

Queen City Machine Tool Co. 295

R

R. B. Tool Co., Inc. 309
Raymac Mfg. Co. 244
Raymond Corp. 269
Reading Machine Co. 318
Ready Tool Co. 190
Reid Tool Supply Co. 266
Reliant Gage & Supply Co. 311



FAST ANGULAR INSPECTION SET-UPS **... with repetitive accuracy**

When minutes mean money, you can realize outstanding economies in your plant with the Robbins Sine Plate.

Using your own standard gauge blocks, angular set-ups take just a few minutes. And, you are certain every set-up is accurate, too, because Robbins Sine Plates are built to precision tolerances on the sine bar method.

For quick, accurate angular set-ups on milling, boring and inspection operations of large work pieces—Robbins has introduced a new 24" square sine plate. This versatile unit is rapidly replacing homemade holding and inspection devices. It also eliminates costly construction time for special "fixed-angle" fixtures which are good for only one job.

If you want to cut costs—meet the most rigid dimensional requirements, then the Robbins Sine Plate is the answer. Get complete details. Write for your free illustrated catalog and price list today.

OMER E. Robbins COMPANY

Dept. B-5

24800 Plymouth Road

Detroit 39, Michigan

Also producers of special gauges and fixtures

For more data circle 597 on Reader Service Card

June, 1955

modern machine shop 353

index to advertisements . . . (For listings of products consult Where To Get It Section)

| | |
|--------------------------------------|-------------|
| Richards Co., J. A. | 210 |
| Robbins Co., Omer E. | 353 |
| Roberts Rubber Co., Weldon | 64 |
| Rockford Machine Tool Co. | 18 |
| Rodgers Hydraulic, Inc. | 243 |
| Rotor Tool Co. | 137 |
| Rowbottom Machine Co. | 320 |
| Royal Oak Tool & Machine Co. | Third Cover |
| Rusnok Tool Wks. | 97 |
| Ruthman Mchry. Co. | 349 |

S

| | |
|--|----------|
| Sales Service Machine Tool Co. | 96 |
| Savage Co., W. J. | 306 |
| Schauer Mfg. Corp. | 158 |
| Scherr Co., Inc., Geo. | 271, 327 |
| Schmidt, Inc., Geo. T. | 263 |
| Scott Paper Co. | 14, 15 |
| Sheldon Machine Co., Inc. | 229 |
| Simonds Abrasive Co. | 221 |
| Simonds Saw & Steel Co. | 25 |
| Skinner Chuck Co. | 303 |
| Smith & Sons, Geo. W. | 178 |
| Snow Mfg. Co. | 147 |
| Somerset Tool Co. | 281 |
| South Bend Lathe Wks. | 237 |
| Sperman Metal Specialties | 206 |
| Springfield Machine Tool Co. | 60, 61 |
| Standard Automotive Parts, Inc. | 316 |
| Standard Electrical Tool Co. | 286 |
| Standard Gage Co. | 155 |
| Standard Horse Nail Corp. | 304 |
| Standard Oil Co. (Indiana) | 177 |
| Standard Pressed Steel Co. | 75, 176 |
| Standard Steel Specialty Co. | 283 |
| Staples Tool Co. | 38 |
| Stearns Magnetic, Inc. | 270 |
| Sterling Factory Equipment Co. | 307 |
| Stevens, Inc., John B. | 290 |
| Strand Div., N. A., Franklin Balmar Corp. | 225 |
| Sturtevant Co., P. A. | 273 |
| Sun Oil Co. | 139 |
| Sundstrand Machine Tool Co. | 256 |
| Superior Indicator Co. | 332 |

T

| | |
|--|---------------|
| Taft-Peirce Mfg. Co. | 142, 143, 355 |
| Tapmatic Corp. | 253 |
| Taylor Dynamometer & Machine Co. | 323 |

| | |
|-------------------------------------|-----|
| Thermo Electric Mfg. Co. | 331 |
| Thriftmaster Products Corp. | 279 |
| Tools, Inc. | 319 |
| Torit Mfg. Co. | 164 |
| Torrington Co. | 22 |
| Troyke Mfg. Co. | 168 |
| Twentieth Century Mfg. Co. | 228 |

U

| | |
|--|-----|
| Union Twist Drill Co. | 63 |
| U. S. Automatic Box Mchry. Co. | 304 |
| U. S. Burke Machine Tool Div. | 239 |
| U. S. Drill Head Co. | 274 |
| U. S. Rubber Co. | 197 |
| Universal Engr. Co. | 297 |

V

| | |
|---|------------|
| Vaill Engr. Co. | 322 |
| Van Keuren Co. | 46 |
| Verson Allsteel Press Co., Inc. | 69 |
| Vimco Mfg. Co. | 283 |
| Vlier Engr., Inc. | 175 |
| Vulcan Tool Co. | 74, 76, 78 |

W

| | |
|---|--------|
| Wade Instrument Co. | 281 |
| Waldes Kohinoor, Inc. | 35 |
| Walker Co., Inc., O. S. | 294 |
| Walls Sales Corp. | 249 |
| Waltham Machine Wks., Inc. | 210 |
| Wardwell Mfg. Co. | 208 |
| Watts Bros. Tool Wks. | 262 |
| Weisser Mchry. Corp. | 265 |
| Weldon Tool Co. | 258 |
| Wells & Sons, W. F. | 276 |
| Whitman & Barnes | 66 |
| Whitney Metal Tool Co. | 216 |
| Wiedemann Machine Co. | 58, 59 |
| Williams & Co., J. H. | 4 |
| Wilson Mechanical Instrument Div. | 165 |
| Winter Bros. Co. | 140 |
| Wirth & Son, Inc., Carl | 300 |
| Wohnip Products, Inc. | 330 |

Z

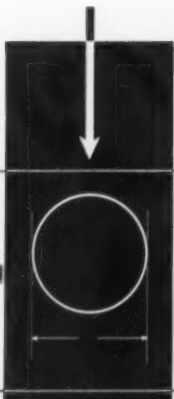
| | |
|---------------------------------|-----|
| Zeh & Hahnemann Co. | 276 |
| Ziegler Tool Co., W. M. | 291 |

Air Gaging for Automation

**Some Taft-Peirce CompAIRator
Air Gage Installations for mass
production quality control...**

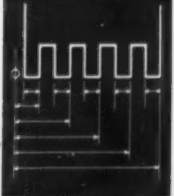
Size Control on Automatic Lathe

This T-P Air-Electric CompAIRator is attached to an automatic lathe. As parts approach tolerance limits, gaging unit sends an electrical impulse to machine, which advances or retracts cutting tool to keep parts in optimum size range. If a part is produced outside the tolerance limits, unit shuts down the machine.



Size Control at Milling Machine

This T-P Air-Electric CompAIRator checks locations and widths of the main bearings of automotive cylinder blocks. 9 dials and lights indicate 5 bearing locations and 4 widths simultaneously. When any location or width is out of tolerance, unit automatically stops milling machine. Light indicates off-size dimension, dial reports exact size.



Size Control in Transfer Machine

This T-P Air-Electric CompAIRator checks 8 cylinder bore diameters simultaneously in V-8 automotive engine blocks. Automatically gages the diameter of the entire length of each bore. If any bore is out of tolerance, a light points it out, and production line is automatically shut down at completion of gaging cycle. Tolerance: .002".



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at the show
Booth B11

*T-P means
Top Precision*



WHAT IS A COMPAIRATOR AIR GAGE?

A CompAIRator is a sensitive gaging instrument that measures variations in the velocity of tiny jets of air. When work is placed over these jets, air flow is restricted and its velocity reduced. Any change in air velocity reflects a change in part size, which is immediately shown on a calibrated indicator. Since only air contacts the part in most cases, there is minimum wear on gaging members. Fast, accurate, dependable, a T-P CompAIRator is simple to operate, requires little or no maintenance.



STANDARD AND SPECIAL
COMPAIRATORS



COMPUTING
COMPAIRATORS



AUTOMATIC SORTING
MACHINE



AIR ELECTRIC
COMPAIRATORS

THE TAFT-PEIRCE MANUFACTURING COMPANY, WOONSOCKET, RHODE ISLAND

Joseph C. Fletcher
278 Brannon St.
San Francisco, Calif.

8 H S Machinery Sales Co.
217 Airport Blvd.
San Francisco, Calif.

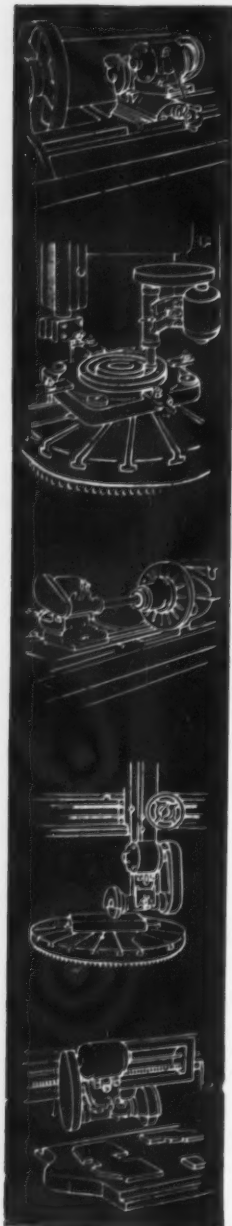
Machinery Sales Co.
2838 Lewis Blvd.
Los Angeles, Calif.

Machinery Tool & Supply Co.
3690 Santa Fe Avenue
Los Angeles, Calif.

J. F. Muellenberg Machinery Co.
124 S. W. Stark Street
Portland, Oregon

Croge & Co.
932 1st Ave. So.
Seattle, Wash.

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External Grinder with two Internal Spindles which are interchangeable with External Spindle on machine.

for Precision Grinding— External Internal Surface!

These versatile Grinders can be mounted on lathes, planers, boring mills, milling machines and other machine tools for a large variety of grinding operations which crop up in every shop.

Rigid construction throughout with large precision type bearings insure accuracy for production and tool room work. Constant speed motors provide the uniform wheel speed so vital for best grinding results.

Dovetail slide on spindles facilitates changing from one spindle to another with perfect alignment.

Large flat pad with several bolt slots adapts the Grinder to the regular tool holding fixture of the machine on which it is to be mounted.

Large selection of Internal Spindles available for various lengths and diameters.

**Made in sizes from 1/4 HP
to 10 HP capacity**

Other "HISEY" Products: Bench and Pedestal Grinders and Buffers; Snagging Grinders; Wet Tool Grinders; Disc Grinders; Drill Grinders and Dust Collectors.

ASK FOR CATALOG 72 MT

Hisey THE HISEY-WOLF MACHINE CO.
CINCINNATI 8, OHIO
Division of The Cincinnati Electrical Tool Co.

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(PLEASE PRINT PLAINLY)

June 1955 Issue

GOOD UNTIL AUGUST 1, 1955

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Your Title _____

Company Name _____

Company Address _____

City _____

Zone _____

State _____

**modern
machine
shop**

431 Main Street
Cincinnati 2, Ohio

Circle KEY numbers (NOT PAGE NUMBERS) for more information on items described or advertised in this issue.

EDITORIAL ITEMS

| | | | | | | | |
|----|----|----|-----|-----|-----|-----|-----|
| 1 | 21 | 41 | 61 | 81 | 101 | 121 | 141 |
| 2 | 22 | 42 | 62 | 82 | 102 | 122 | 142 |
| 3 | 23 | 43 | 63 | 83 | 103 | 123 | 143 |
| 4 | 24 | 44 | 64 | 84 | 104 | 124 | 144 |
| 5 | 25 | 45 | 65 | 85 | 105 | 125 | 145 |
| 6 | 26 | 46 | 66 | 86 | 106 | 126 | 146 |
| 7 | 27 | 47 | 67 | 87 | 107 | 127 | 147 |
| 8 | 28 | 48 | 68 | 88 | 108 | 128 | 148 |
| 9 | 29 | 49 | 69 | 89 | 109 | 129 | 149 |
| 10 | 30 | 50 | 70 | 90 | 110 | 130 | 150 |
| 11 | 31 | 51 | 71 | 91 | 111 | 131 | 151 |
| 12 | 32 | 52 | 72 | 92 | 112 | 132 | 152 |
| 13 | 33 | 53 | 73 | 93 | 113 | 133 | 153 |
| 14 | 34 | 54 | 74 | 94 | 114 | 134 | 154 |
| 15 | 35 | 55 | 75 | 95 | 115 | 135 | 155 |
| 16 | 36 | 56 | 76 | 96 | 116 | 136 | 156 |
| 17 | 37 | 57 | 77 | 97 | 117 | 137 | 157 |
| 18 | 38 | 58 | 78 | 98 | 118 | 138 | 158 |
| 19 | 39 | 59 | 79 | 99 | 119 | 139 | 159 |
| 20 | 40 | 80 | 100 | 120 | 140 | 160 | |

ADVERTISEMENTS

| | First Cover | | | | Second Cover | | | | Third Cover | | | | Fourth Cover | | | |
|-----|-------------|-----|-----|-----|--------------|-----|-----|-----|-------------|-----|-----|-----|--------------|-----|-----|-----|
| 201 | 220 | 239 | 258 | 277 | 296 | 366 | 385 | 404 | 423 | 442 | 461 | 480 | 499 | 518 | 537 | 556 |
| 202 | 221 | 240 | 259 | 278 | 297 | 367 | 386 | 405 | 424 | 443 | 462 | 481 | 500 | 519 | 538 | 557 |
| 203 | 222 | 241 | 260 | 279 | 298 | 368 | 387 | 406 | 425 | 444 | 463 | 482 | 501 | 520 | 539 | 558 |
| 204 | 223 | 242 | 261 | 280 | | 369 | 388 | 407 | 426 | 445 | 464 | 483 | 502 | 521 | 540 | 559 |
| 205 | 224 | 243 | 262 | 281 | 351 | 370 | 389 | 408 | 427 | 446 | 465 | 484 | 503 | 522 | 541 | 560 |
| 206 | 225 | 244 | 263 | 282 | 352 | 371 | 390 | 409 | 428 | 447 | 466 | 485 | 504 | 523 | 542 | 561 |
| 207 | 226 | 245 | 264 | 283 | 353 | 372 | 391 | 410 | 429 | 448 | 467 | 486 | 505 | 524 | 543 | 562 |
| 208 | 227 | 246 | 265 | 284 | 354 | 373 | 392 | 411 | 430 | 449 | 468 | 487 | 506 | 525 | 544 | 563 |
| 209 | 228 | 247 | 266 | 285 | 355 | 374 | 393 | 412 | 431 | 450 | 469 | 488 | 507 | 526 | 545 | 564 |
| 210 | 229 | 248 | 267 | 286 | 356 | 375 | 394 | 413 | 432 | 451 | 470 | 489 | 508 | 527 | 546 | 565 |
| 211 | 230 | 249 | 268 | 287 | 357 | 376 | 395 | 414 | 433 | 452 | 471 | 490 | 509 | 528 | 547 | 566 |
| 212 | 231 | 250 | 269 | 288 | 358 | 377 | 396 | 415 | 434 | 453 | 472 | 491 | 510 | 529 | 548 | 567 |
| 213 | 232 | 251 | 270 | 289 | 359 | 378 | 397 | 416 | 435 | 454 | 473 | 492 | 511 | 530 | 549 | 568 |
| 214 | 233 | 252 | 271 | 290 | 360 | 379 | 398 | 417 | 436 | 455 | 474 | 493 | 512 | 531 | 550 | 569 |
| 215 | 234 | 253 | 272 | 291 | 361 | 380 | 399 | 418 | 437 | 456 | 475 | 494 | 513 | 532 | 551 | 570 |
| 216 | 235 | 254 | 273 | 292 | 362 | 381 | 400 | 419 | 438 | 457 | 476 | 495 | 514 | 533 | 552 | 571 |
| 217 | 236 | 255 | 274 | 293 | 363 | 382 | 401 | 420 | 439 | 458 | 477 | 496 | 515 | 534 | 553 | 572 |
| 218 | 237 | 256 | 275 | 294 | 364 | 383 | 402 | 421 | 440 | 459 | 478 | 497 | 516 | 535 | 554 | 573 |
| 219 | 238 | 257 | 276 | 295 | 365 | 384 | 403 | 422 | 441 | 460 | 479 | 498 | 517 | 536 | 555 | 574 |

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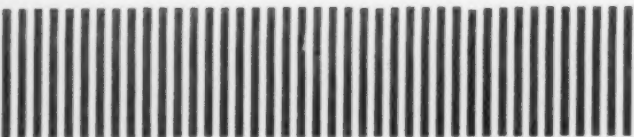
**modern
machine
shop**

BOX 74

VILLAGE STATION

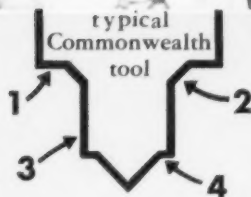
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R-O
UNIVERSAL
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- 1 Axial relief only for spotfacing
- 2 Axial and radial relief for chamfering
- 3 Slight radial relief for clearance on non-cutting diameter
- 4 Axial relief only on counterbore

Fred J. Stelter, Factory Superintendent, 43 years with Commonwealth Brass Corp., Detroit, Michigan, says, "We now obtain any relief we want on any edge. R-O ground tools cut faster and without chatter. Intersections are perfect and tools last 60 to 100% longer. We grind over 60 different designs of tools on the R-O."

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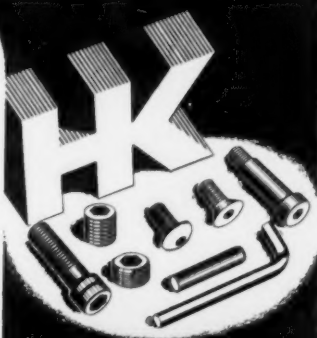
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